PURCHASING

FEBRUARY, 1950

PUBLIC LIBRARY
FEB 15 1950
DETROIT

R. N. Patrick:

"PUBLIC RELATIONS" IS EVERYBODY'S BUSINESS

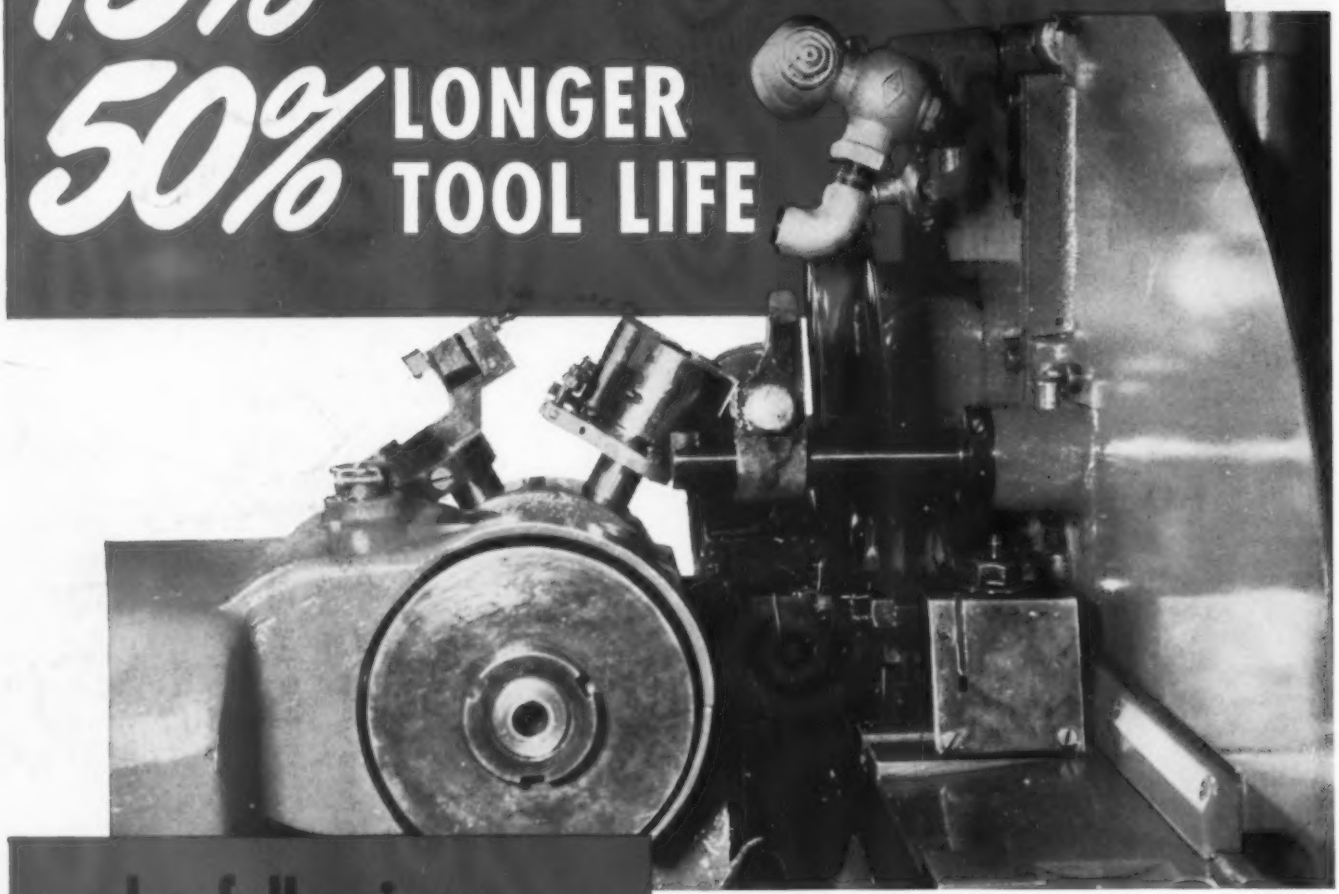
See Page 97

Table of Contents

Pages 81-85

A CONOVER-MAST PUBLICATION • 50 CENTS

15% MORE PRODUCTION
50% LONGER TOOL LIFE



...by following the Texaco Lubrication Engineer's recommendation

A California manufacturer* machining SAE 1018 steel on Brown & Sharpe automatics, was experiencing excessive tool failures and having difficulty in getting proper finish on parts. After a thorough study of the machining operations and the condition of the cutting tools, a Texaco Lubrication Engineer recommended *Texaco Transultex Cutting Oil* to overcome the trouble.

Results of following this recommendation have been: (1) desired finish obtained, (2) increase of about 50% in tool life, (3) 15% increase in production output due to a 15-second reduction in the machine time cycle.

Whatever machining you are doing, there is a Texaco Cutting, Grinding or Soluble Oil to do it more effectively. And a Texaco Lubrication Engineer, specializing in machining operations, will gladly help you select the right coolants to help you work your metal better, faster and at lower cost.

Get these benefits in *your* plant. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

*Name on request

TEXACO

TEXACO CUTTING, GRINDING AND SOLUBLE OILS FOR FASTER MACHINING

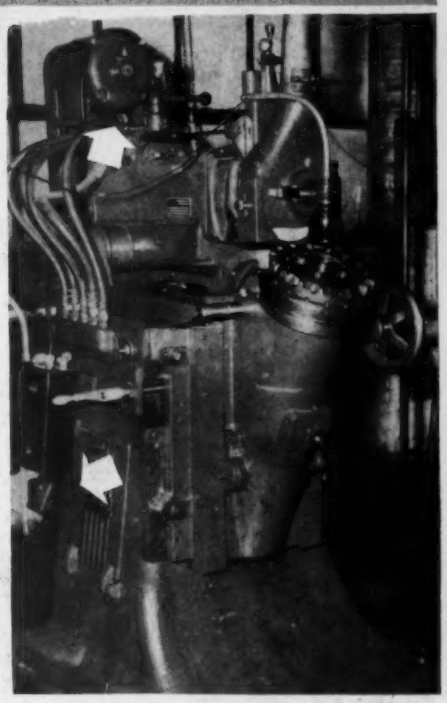
TUNE IN . . . TEXACO presents MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA radio broadcasts every Saturday afternoon.

Century MOTORS'

REMARKABLE FREEDOM From VIBRATION

HELPS YOU MAINTAIN TOOL ROOM

Precision ON PRODUCTION JOBS



Two Century 1 Horsepower squirrel cage motors driving milling machines in a well-organized shop.

Century C MOTORS' ability to start and run smoothly and quietly minimizes the possibility of transmitting vibration to parts being machined. Their remarkable freedom from vibration permits closer tolerances, higher production rates, fewer rejects, lower production costs.

Century motors are built to match the precision of the machines they drive. They are correctly designed, accurately constructed, well-balanced mechanically and electrically, and thoroughly tested.

When you select the right Century motor, you can be sure that it's pre-engineered to meet the requirements of your machine.

It's easy to select the right Century motor for your job because Century motors are built in a wide range of types — in sizes from 1/6 to 400 horsepower — to meet all popular electric power requirements.

Specify Century on all your new equipment — and for replacement. Write for new bulletin on selective speed drives which permit electrically selected optimum speeds.

Popular types of standard ratings are generally available from factory and branch office stocks.

ALTERNATING CURRENT MOTORS

POLYPHASE
- Squirrel Cage Induction — 1/6 to 400 HP
- Wound Rotor Motors — 1 to 350 HP
- Synchronous — 20 to 150 HP
- Split Phase Induction — 1/6, 1/4, 1/3 HP
- Capacitor — 1/6 to 20 HP
- Repulsion Start Induction Brush Lifting — 1/2 to 15 HP

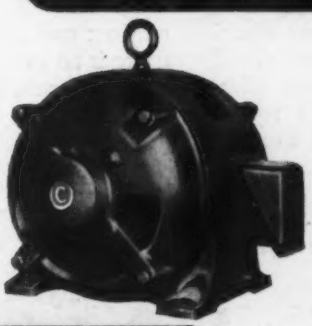
DIRECT CURRENT MOTORS

1/6 to 300 HP

GENERATORS
- AC 500 Watts to 300 KVA
- DC 250 Watts to 200 KW

MOTOR GENERATOR SETS
- AC to DC, AC to AC
- DC to DC, DC to AC

OPEN PROTECTED, SPLASH PROOF, TOTALLY ENCLOSED FAN COOLED, EXPLOSION PROOF



Ball Bearing Motors are factory lubricated for several years' normal service. Bearing housing construction permits easy re-lubrication when unusual service demands it.

CENTURY ELECTRIC COMPANY

Century C MOTORS

1806 Pine St. • St. Louis 3, Mo.

Offices and Stock Points in Principal Cities

649

PURCHASING published monthly, by PEEAYE, INC., subsidiary CONOVER-MAST PUBLICATIONS, INC. Publication Office, Orange, Conn. Editorial and Executive Offices, 205 East 42nd St., New York 17, N. Y. Entered as second class matter August 8, 1942, at the Post Office in Orange, Conn., under the act of March 3, 1879. Subscription rates: United States, U. S. Possessions and Canada: $4 per year, $6 for two years; elsewhere $6 per year, $10 for two years. Single copies 50c. Volume XXVIII, No. 2.

Photo Courtesy St. Regis Paper Company

How to make belt ends disappear

B. F. Goodrich Plylock Splice makes belts endless, outlasts metal-fastened belts 3 to 1

BELTS become truly endless when joined by the B.F.Goodrich Plylock Splice. They often outlast belts with metal fasteners 3 to 1. The splice itself will last as long as the rest of the belt. And, because 90% of all open-end transmission belt troubles are caused by metal fasteners, Plylock drastically reduces maintenance. Here's the Plylock story —

How it is made — Belt ends are "stepped down". A small piece of the *second ply* is removed. As ends are fitted together, the outside ply ends are countersunk into the depression in the second ply. They are held in place by a flexible top layer which is not under tension; and the joint is vulcanized to make it an integral part of the belt — same thickness, flexibility, performance.

Triples belt life — Plylock Splice often triples belt life, because belts are not worn and torn by metal fasteners working out. Plylock uses no fasteners, brads, laces or stitching of any kind. There is no exposed surface to tear apart with flexing and windage.

Improves operation — A Plylocked joint is virtually as flexible as the rest of the belt. There is no added thickness at the splice to cause stiffness. Thickness and flexibility uniform with the rest of the belt deliver a smooth, even flow of power — without slipping, bumping, noise or vibration.

Quick replacement — You can now have endless belts in hours instead of days or weeks. The Plylock joint can be made in your own plant, right on the drive. Work stoppages are minimized.

B.F.Goodrich distributors make the Plylock Splice in their own shops or on your machines; or they will show your own mechanics how to make it. *The B.F.Goodrich Company, Industrial and General Products Division, Akron, O.*

Plylock Belt Joint
by
B.F.Goodrich

Inland Steel, too, Is Supplied to Fit *Your* Needs

Your decorator furnishes harmonious interior effects, individualized to your personal tastes. And, similarly, Inland supplies uniform, high-quality steel, *job-fitted* to your individual requirements. Inland's compact organization . . . complete integration . . . and centralized facilities insure the prompt decisions and flexibility of operation that make possible this service—"*Steel—made to your specifications.*"

INLAND STEEL CO., 38 South Dearborn Street, Chicago 3, Illinois. Sales Offices: Chicago, Davenport, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

INLAND STEEL

BARS • STRUCTURALS • PLATES
SHEETS • STRIP • TIN PLATE
FLOOR PLATE • PILING • RAILS
TRACK ACCESSORIES

. . . and
This "Inland Team"
Gives Your Steel
Their Personal Attention

METALLURGY SALES OPERATIONS

Be Sure Your
HACKSAWS, BAND SAWS and BAND KNIVES
are backed by the name
Starrett

Blades or bands bearing the Starrett name must uphold the Starrett reputation. You get extra assurance of top performance, uniformity and maximum cutting economy when you specify hacksaws, band saws and band knives precision made by the "World's Greatest Toolmakers".

Get these buying guides

Both FREE on request, address Dept. "P"

NEW Starrett Hacksaw and Band Saw Catalog helps you choose the right hacksaw or band saw for any cutting job.

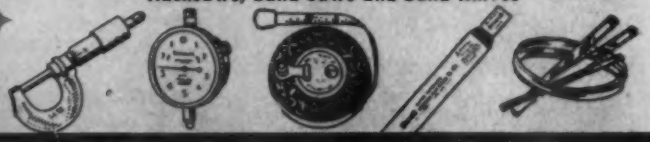
NEW Starrett FAST-KUT Band Knife Folder describes the complete line of band knives for high speed, low cost, precision cutting of soft or fibrous materials.

Make STARRETT Your Headquarters For All Precision Cutting

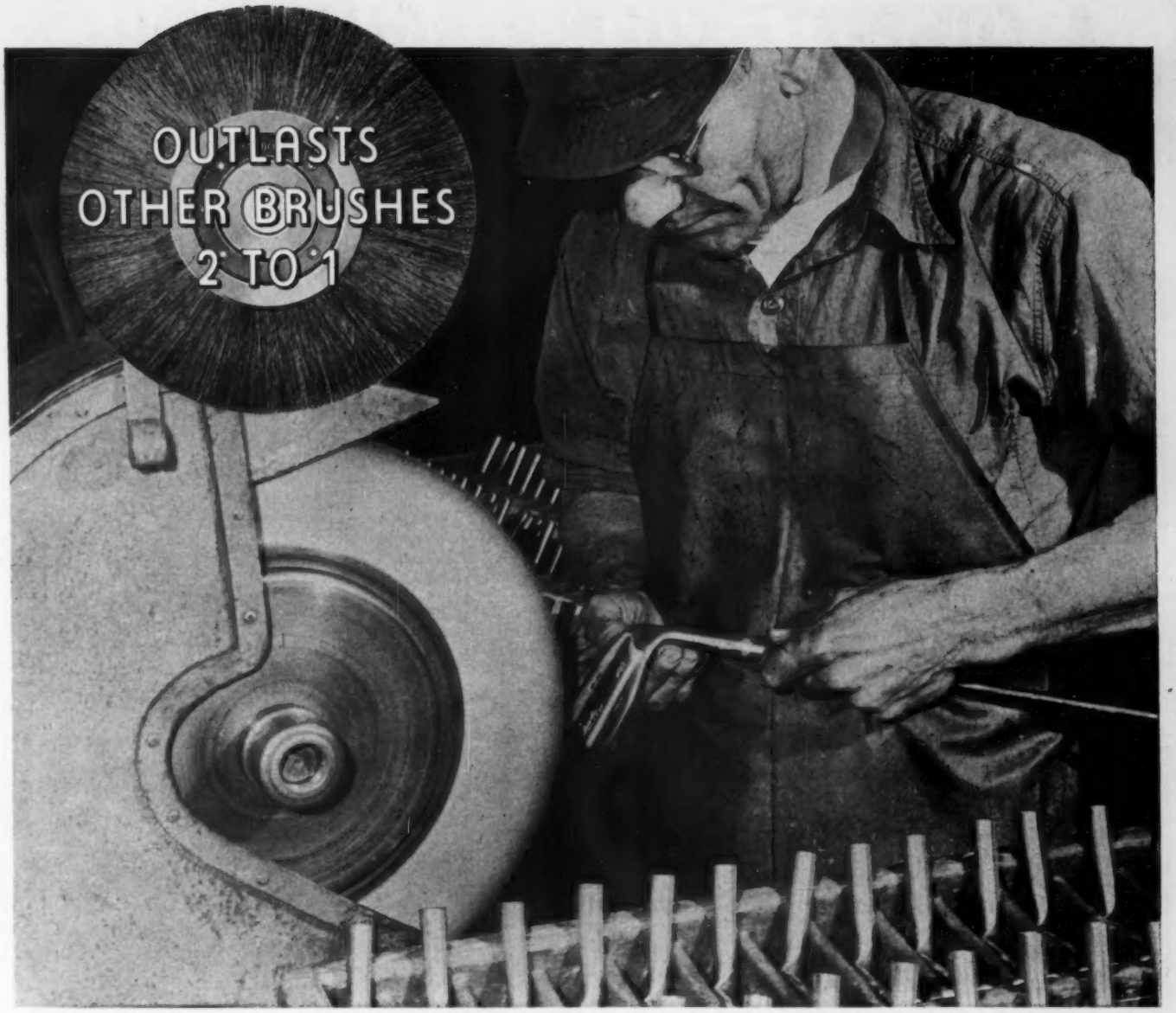
Starrett now meets all requirements for Hacksaws, Band Saws and Band Knives. Precision made by the World's Greatest Toolmakers in a new, modern building with latest facilities, advanced techniques and highest quality standards. Finest steel, scientific heat treatment plus precision manufacturing combine to make STARRETT your best buy.

TRADE MARK
Starrett
REG. U.S. PAT. OFF.
Standard of Precision

BUY THROUGH YOUR DISTRIBUTOR
Mechanics' Hand Measuring Tools and Precision Instruments
Dial Indicators • Steel Tapes • Precision Ground Flat Stock
Hacksaws, Band Saws and Band Knives



THE L. S. STARRETT CO. . *World's Greatest Toolmakers* . ATHOL, MASSACHUSETTS · U. S. A.



TAKES SLICE OUT OF FINISHING COSTS with *OSBORN BRUSHES*

● Whether brushing stainless steel to a lustrous satin-like finish or brushing carbon steel to refine its polish prior to plating, Osborn MONARCH® Power Driven Brushes perform the job easier, faster and at a lower cost. In the application pictured above, Osborn MONARCH® Brushes *outlast all others 2 to 1.* This longer brush life is the result of the Osborn Ringlock construction, which prevents shedding, assures balance and a full, even working face required in an efficient brushing tool.

For your finishing problems, whether removing scale or producing micro-smoothness on metal, plastics or any other materials, consult an experienced Osborn Sales Engineer. Write or call:

THE OSBORN MANUFACTURING COMPANY
Dept. 241, 5401 Hamilton Avenue Cleveland 14, Ohio

Osborn Brushes

WORLD'S LARGEST MANUFACTURER OF BRUSHES FOR INDUSTRY • POWER DRIVEN BRUSHES • PAINT BRUSHES • MAINTENANCE BRUSHES

A COMPLETE COPPER ROLLING MILL

plus 7 *Warehouses*

PROVIDE PROMPT—
DEPENDABLE SERVICE ON

HUSSEY

COPPER AND BRASS

PITTSBURGH, PA.
2850 Second Ave.
Telephone: GRant 1-3650

CLEVELAND, OHIO
5318 St. Clair Ave.
Telephone: UTah 1-3838

NEW YORK, N. Y.
140 Sixth Ave.
Telephone: CAnal 6-6326

CHICAGO, ILL.
3900 N. Elston Ave.
Telephone: COrnelia 7-2234

ST. LOUIS, MO.
1620 Delmar Blvd.
Telephone: CEntral 9192

PHILADELPHIA, PA.
1632 Fairmount Ave.
Telephone: FRemont 7-7370

CINCINNATI, OHIO
424 Commercial Square
Telephone: MAin 2832

Write, Phone or Wire Your Requirements Today!

Fast Delivery! Quick Pick-Up!

C. G. HUSSEY & COMPANY
(Division of Copper Range Co.)
ROLLING MILLS AND GENERAL OFFICES
PITTSBURGH 19, PA.

Hussey Warehouses carry stocks of Copper and Brass Products for Prompt Shipment

COPPER HUSSEY BRASS

Our 102nd year
1848-1950

DERMATITIS
CAN HANDCUFF YOUR PRODUCTION!

Safeguard All Hands with WEST LAN-O-KLEEN HAND CLEANSER

The shackles of industrial dermatitis can handcuff your workers' manual efficiency—tie up your production schedules—cripple plant morale—and cut sharply into your profits.

One way to remove these costly shackles is to avoid *unsafe* wash-up soaps. Instead, use WEST LAN-O-KLEEN—the mild, safe, quick-acting powdered soap that helps *protect* hands against the effects of industrial irritants. Dispensed through an economical, modern dispenser, WEST LAN-O-KLEEN contains no harsh ingredients or excess alkali to harm sensitive skins. Also, it is prepared of a gentle corn meal base which is "lanolinized"—thus helping to offset loss of natural skin oils.

TRY LAN-O-KLEEN FREE—and SEE!

Fill out the coupon below! It'll bring you a sample of industry-proved WEST LAN-O-KLEEN without obligation. Along with this you'll receive a fact-packed booklet. It'll explain how WEST LAN-O-KLEEN and the modern LAN-O-KLEEN DISPENSER can cut your costs considerably.

SEND FOR FREE SAMPLE

WEST DISINFECTING Company

42-16 West Street,
Long Island City 1, N. Y.

WEST DISINFECTING COMPANY
42-16 West Street, Long Island City 1, N. Y.

Gentlemen:

Please send me a free sample carton of LAN-O-KLEEN.

Name_____ Position_____

Company_____

Address_____

City_____ State_____

15

Want Additional Product Information? See Page 19.

Makes everyone's job easier!

PARKER-KALON
SIZE-MARKED
Socket Head Cap Screws

Tool crib bosses

like 'em because the Size-Mark speeds up sorting of left-over, mixed screws, without the bother of "miking" or gauging.

Assembly workers

welcome them because the Size-Mark speeds the job. Sizes are always issued correctly — there's no time wasted, no annoyance.

Apprentices

are all for them because the Size-Mark saves time, protects "green hands" from errors, helps them learn faster.

and that GEAR GRIP† makes 'em slip-proof!

† U. S. DESIGN PAT. NO. 126,409

Even when fingers are oily, the GEAR GRIP on P-K* Socket Head Cap Screws prevents slipping. When fingers can fly, the work flies!

Only Parker-Kalon offers the SIZE-MARK and GEAR GRIP. Take advantage of these exclusive features—watch your product's assembly costs go down, its sales appeal go up.

SEND FOR SAMPLES and Stock List. Simply address Parker-Kalon Corporation, 200 Varick St., New York 14, N. Y.

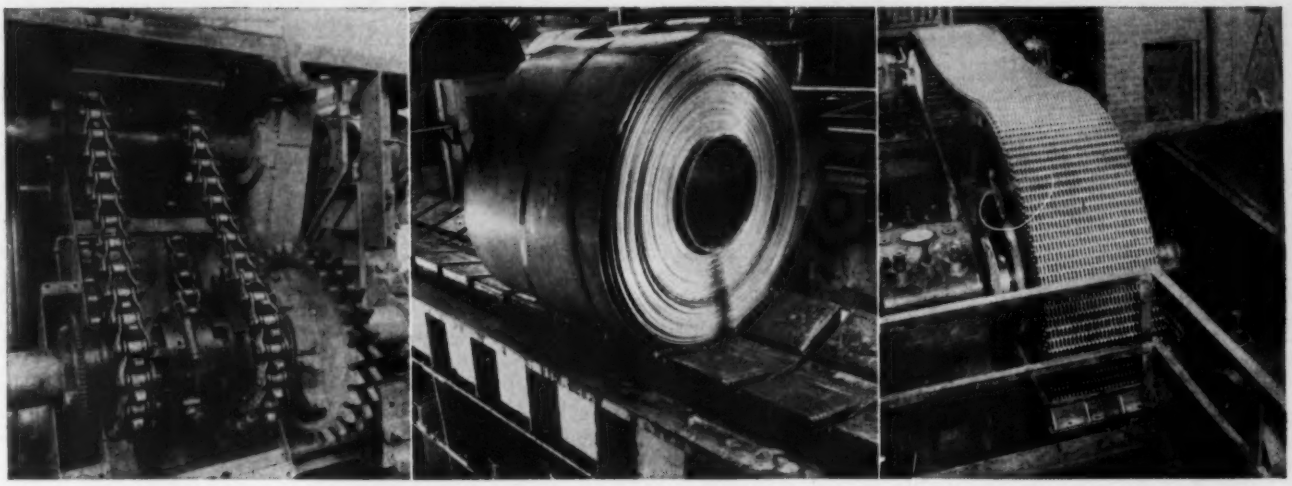
P-K **PARKER-KALON*** *cold-forged* **SOCKET SCREWS**

SIZE-MARKED SOCKET HEAD CAP SCREWS • GROUND THREAD SOCKET SET SCREWS
FLAT HEAD SOCKET CAP SCREWS • STRIPPER BOLTS • PIPE PLUGS • HEX KEYS

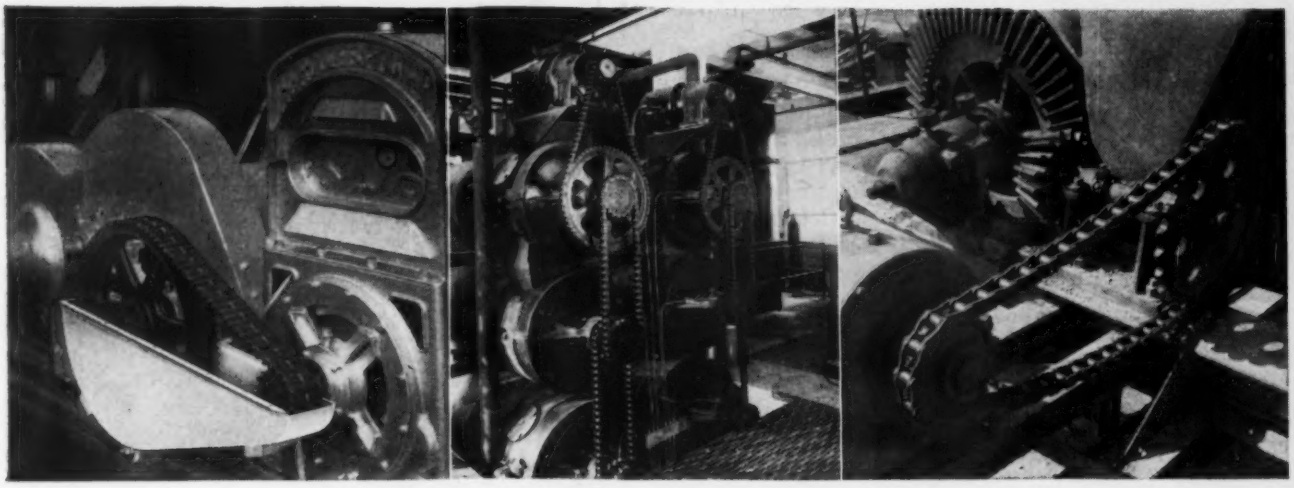
AVAILABLE EVERYWHERE THROUGH ACCREDITED DISTRIBUTORS

*TRADE MARKS REG. U. S. PAT. OFF.

. . for Chain advice, based upon longest experience



. . for Chain advice, backed by the finest facilities,



. . we invite you to consult Link-Belt Engineers . .

You are invited to draw upon the most extensive and intensive experience in the application and production of chains for drives, conveyors or elevators. Your problem is very likely well within the broad Link-Belt experience, and a discussion with a Link-Belt engineer may very well produce a speedy and proper solution.

You are invited to consult Link-Belt without obligation.

LINK-BELT COMPANY Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices, Factory Branch Stores and Distributors in Principal Cities. 11,331-A

. . Chain--by LINK-BELT

for Drives and Conveyors

The LATEST Trade LITERATURE

Check over all Five Pages-12, 14, 16, 19 & 20

(This is Page 12)

You will want a number of these new catalogs and bulletins to bring your information files up-to-date. Simply let us have a short letter on your company letterhead indicating the numbers of the items you want.

(This service also includes Products shown on New Products pages)

☐ **1. CONTROL CENTERS**—Standardized control centers are described in detail in booklet B-4213. The text also includes reference tables for the selection of starter sizes. Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.

☐ **2. PICKLING, CLEANING**—Hibitite, powerful acid inhibitor, is subject of Monsanto Technical Bulletin No. 0-59. It is used in pickling and cleaning of ferrous metals and is an excellent aid in producing clean, bright, high-quality product without excessive acid or metal losses. It is available as dry powder for those who prepare their own solutions and as standard strengths of both sulphuric and muriatic acids already containing Hibitite. Monsanto Chemical Co., St. Louis 4, Mo.

☐ **3. BROACHING MACHINES**—Technical Bulletin RU-49 outlines uses and features of Pull-Up type broaching machines, together with dimensional drawings and illustrations, etc. Machines are available in 6, 10, 15 and 25 ton capacities and stroke lengths ranging from 42 to 66 inches. Colonial Broach Co., Box 37, Harper Sta., Detroit 13, Mich.

☐ **4. OPTICAL INSPECTION**—8-Page book describes Kodak Contour Projector and provides information on rapid optical inspection of parts by comparing enlarged image with tolerance chart. Conventional shadow projection is illustrated, together with surface inspection for inspecting blind holes and other dimensions that cannot be silhouetted. Eastman Kodak Company, Rochester 4, N. Y.

☐ **5. TIME RECORDERS**—Series 1000 Job Cost and Payroll recorder—electric motor drive or master clock operation, is subject of new bulletin. Large variety of combinations of time data available on the printing wheels to suit specific requirements. The Cincinnati Time Recorder Co., 1746 Central Ave., Cincinnati 14, O.

☐ **6. INDUSTRIAL CRANE**—Karri-Go is the name of front-boom industrial crane, 5 tons capacity, described in Bulletin 73. It lifts, carries and places loads up to 10,000 pounds. Bulletin describes it in detail. Silent Hoist & Crane Co., Brooklyn 20, N. Y.

☐ **7. RUST PREVENTIVES**—Chart is styled a comprehensive source of authentic data for rust-proofing metal parts. It gives information on correct rust protection methods for metal parts to be stored either indoors or outdoors; also describes application and removal of rust preventive materials. Lists U. S. Government specifications. Nox-Rust Chemical Corp., 2429 S. Halsted Street, Chicago 8, Ill.

☐ **8. GRINDING, DUST COLLECTION**—Equipment for production and handling of fine and ultra-fine powders of chemicals, colors, cosmetics, resins, food products, ceramics, minerals and metals, etc. are described in detail in new 50-page book on the Mikro plan for processing efficiency. Pulverizing Machinery Co., 181 Chatham Road, Summit, N. J.

☐ **9. SEMS CATALOG**—Lock washer screws, Sems, assembled screw and free-rotating washer are subject of 28-page catalog No. 80-A. Variety of head styles are illustrated, as is broad range of lock washers assembled on various types of screws. List prices are quoted on plain Sems in various sizes, styles and finishes. Pheoll Manufacturing Co., 5700 Roosevelt Road, Chicago 50, Ill.

☐ **10. ROLLING DOORS**—Rolling steel doors, steel grilles and sliding steel grilles, moving stairway enclosures, side rolling partitions, upward acting doors, etc. are illustrated and described in Catalog Z-27 just issued by Cornell Iron Works, Inc., 36th Ave. and 13th St., Long Island City, N. Y.

☐ **11. OILERS**—General catalog covers complete line of oilers, both spring bottom and pump types, gasoline and oil cans and other lubricating devices. New items shown include all-purpose pump oiler, the Super Oiler and the new Flexo spout filler can. Eagle Manufacturing Co., Wellsburg, West Va.

☐ **12. IMPROVED CASTINGS**—How cast iron quality can be improved through the addition of briquetted ferro-alloys of silicon, manganese and chromium is discussed in 24-page illustrated booklet entitled "Briquetted Alloys for the Iron Foundry Industry," available from Electro Metallurgical Divn., Union Carbide & Carbon Corp., 30 E. 42nd St., New York, N. Y.

☐ **13. SIGNS**—Porcelain Enamel Signs—advertising, industrial traffic signs, street markers, etc., are the subject of catalog available from the Southwestern Porcelain Steel Corp., 601 Wright Bldg., Tulsa, Okla.

☐ **14. MOTOR STARTERS**—Booklet "Look Inside and Compare" tells about G. E. motor starters in popular sizes for motors to 50 hp. Coil is locked in plastic block; burn-resistant arc hood snuffs arc immediately; large silver contacts give long life; magnet has quick direct action and large striking surface. General Electric Co., Apparatus Dept., Section E676-281, Schenectady 5, N. Y.

☐ **15. CASTINGS**—"Quality Castings—Better Service" is title of booklet describing facilities geared to the making of a wide range of gray iron castings—S.A.E. or A.

(Please turn to page 14)

STRAIGHT

as a beeline

. . . any way you look at it

A FILE in the making faces many temptations to stray from the straight-and-narrow path. But Nicholson manufacture patrols every step from forging to finishing.

Not only is straightness essential for doing a good filing job—especially where accurate stroking is required—but it is also evidence that the blank has been evenly surfaced and annealed, the teeth carefully cut, and the file uniformly hardened.

Yet this is only part of the story of Nicholson quality. Maintaining rigid standards in the high carbon steel used; guarding against decarbonization during the manufacturing processes; *testing each individual file* for soundness, sharpness and durability . . . these add to the combination of factors that make Nicholson and Black Diamond really great files.

Their purchase cost is insignificant in relation to the better work, increased production, and savings in workmen's time they enable. For these good reasons, they're the brands most industrial distributors prefer to handle.

"FILE FILOSOPHY," Nicholson's famous 48-page illustrated book (16th edition) on manufacture, kinds, use and care of files, will give your executive, purchasing, production and shop heads further valuable information. How many copies? *Free.*

NICHOLSON U.S.A. **NICHOLSON FILE CO. • 28 ACORN STREET, PROVIDENCE 1, RHODE ISLAND**
(In Canada, Port Hope, Ont.)

BLACK DIAMOND

NICHOLSON . . . A FILE FOR EVERY PURPOSE

The LATEST Trade LITERATURE

Check over all Five Pages — 12, 14, 16, 19 & 20

(This is Page 14)

You will want a number of these new catalogs and bulletins to bring your information files up-to-date. Simply let us have a short letter on your company letterhead indicating the numbers of the items you want.

(Continued from page 12)

S.T.M. specifications—plain or alloyed. Forest City Foundries, 2500 W. 27th St., Cleveland 13, Ohio.

☐ **16. ELECTRIC MOTORS**—Series of data bulletins for appliance and equipment manufacturers with applications for motors of 1/20 to 5 hp., are available as follows: 314-A, capacitor-start motors; 314-B, split-phase motors; 314-C integral motors; 314-D, fan-duty motors; 314-E, oil burner motors, and 314-F, jet pump motors. The Emerson Electric Mfg. Co., St. Louis 21, Mo.

☐ **17. BELT LACING**—Catalog describes Wiregrip belt hooks (6 sizes), Steelgrip flexible lacing, applied with a hammer, Plategrip fasteners for conveyor belts, and other types of fasteners. Armstrong-Bray & Co. 5368 Northwest Highway, Chicago, Ill.

☐ **18. CHAIN DRIVES** — Silent Chain Drive catalog contains stock drive selection tables which make ordering and specifying a complete chain drive a time-saving process. Drives are available for applications from fractional hp to well over 50 hp. Whitney Chain & Mfg. Co., Hartford 2, Conn.

☐ **19. ABRASIVES** — No-Lap is title of catalog detailing abrasive sleeves, drums and belts of approved Carborundum quality, and other time and money-saving products. Samples available upon request. Cleveland Container Co., 6201 Barberton Ave., Cleveland 2, Ohio.

☐ **20. SELF-LOCKING SET SCREW**—Data sheet illustrates and describes Zip-Grip self-locking set screw and adjusting screw. Triple-locking action is described, numerous applications are suggested, and technical data as to sizes, heads, metals, etc., is furnished. Test samples and data sheets available on request. Set Screw & Mfg. Co., 142 Main St., Bartlett, Ill.

☐ **21. NEW CLAMP**—The Neg'ator Clamp is the first elastic member in history to exhibit negative or constant force deflection characteristics. It is featured by automatic take-up enormous extendability, flexibility of fit, high initial pressure and constant pressure, coil form of heads, and long life. New bulletin illustrates uses, and describes Neg'ator principles and characteristics in detail. It is based on an entirely new mechanical principle. Hunter Spring Company, Lansdale, Pa.

☐ **22. BEARINGS, CASTINGS**—"Bronze & Copper Bearings and Castings", 28 pages, illustrated with pictures and charts gives physical properties and comparative specifications for 27 different bronze alloys and 5 aluminum and manganese bronzes. Babbitt metals, their descriptions and uses are discussed. Booklet also describes complete manufacturing and service facilities of National Bearing Division, American Brake Shoe Co., 4930 Manchester Ave., St. Louis 10, Mo.

☐ **23. STEEL CASTINGS** — The "twelve" basic considerations which should govern the selection of a supplier of steel castings—and other industrial suppliers as well—are reviewed in new 32-page brochure issued by Continental Foundry & Machine Co., 220 Grant St., Pittsburgh, Pa.

☐ **24. FREIGHT ELEVATORS**—Booklet B4402 tells how to select freight elevators. This 44-page Buyer's Guide explains basic considerations, and uses case example method to describe procedural steps. Westinghouse Electric Corp., 306 4th Ave., Pittsburgh 30, Pa.

☐ **25. TEMPERATURE INDICATORS**—Booklet GEC 565 covers new line of temperature indicators for industrial and laboratory use. Included are cold-end compensated thermocouple thermometers for measuring temperatures up to 3000 F and resistance thermometers for temperatures up to 300 F. Apparatus Department, General Electric Co., Schenectady, N. Y.

☐ **26. HEADERS, LEADS, etc.**—Multiple headers, sealed leads and gasket type bushings are covered by Bulletins 850, 849 and 851. Headers are vacuum tight and silicone coated; 24 standard terminals most useful for general application are illustrated; bushings have high resistance to mechanical and thermal shock. Electrical Industries, Inc., 44 Summer Ave., Newark 4, N. J.

☐ **27. LUBRICATING DEVICES**—Four-page bulletin 4800-OB is condensed catalog of Trico lubricating devices. Various units are described and illustrated. It contains application suggestions and shows how waste and hazards of hand-oiling can be eliminated. Trico Fuse Mfg. Co., 2948 N. 5th St., Milwaukee 12, Wis.

☐ **28. TRENCH DIGGER** — Catalog describes utility-size, rubber tire mounted Model 80 Trenchmobile which is powered with 31 hp gasoline engine and equipped to dig in eight separate feeds from 1.7 to 14.6 ft. per minute, 5 or 8 inches wide and up to 4 feet deep. Travels under its own power. Parsons Co., Newton, Iowa.

☐ **29. ELECTRIC MOTORS**—Splash-Proof motor designed for locations subject to direct streams of water or other liquids, which may be mounted in any position, is described in bulletin. It is available in wide range of hp ratings. Sterling Electric Motors, Los Angeles 22, Calif.

☐ **30. SAFETY PROGRAM**—Booklet "How to Set Up and Conduct a Safety Rx Program" tells how to build up an eye safety program, and contains instructions on use of Safety Rx Order Book supplied by the company to industrial concerns. American Optical Co., Southbridge, Mass.

☐ **31. OTISCOLOY** — Low alloy high strength steel is described in 32-page brochure "The Transpor-

(Please turn to page 16)

SPECIFY BOTH

1 Macwhyte Wire Rope

for your cranes and hoists . . .

Because Macwhyte manufactures "a thousand and one" wire ropes, you can select a wire rope of exactly the correct size and construction for your equipment. Because you get the rope best suited for your equipment, you get economical service!

Whatever your lifting problem, our engineers will be glad to give you the benefit of their specialized experience. Write direct to Macwhyte Company or your Macwhyte Distributor.

2 Macwhyte Slings

made to order for safe handling . . .

Macwhyte manufactures ATLAS Round Braided Wire Rope Slings, DREW Flat Braided Slings, and MONARCH Single Part Slings. You get lower-cost, more efficient handling because there's a Macwhyte Sling that's the right sling for your handling work. Macwhyte Slings are equipped with necessary fittings and come to you complete, ready to use!

A thousand and one
WIRE ROPES
made by
MACWHYTE,
all job-proved . . .

Macwhyte Company, 2918 Fourteenth Avenue, Kenosha, Wisconsin. *In addition to PREformed, Internally Lubricated bright steel wire rope and Braided Wire Rope Slings, Macwhyte Company manufactures Stainless Steel, Monel Metal and Galvanized Wire Rope, Aircraft Cables and "Safe-Lock" Cable Terminals. Macwhyte distributors throughout the U.S.A. and other countries. Mill depots in the following cities: New York, Pittsburgh, Chicago, Minneapolis, Fort Worth, Portland, Seattle, San Francisco, Los Angeles.*

The LATEST Trade LITERATURE

Check over all Five Pages — 12, 14, 16, 19 & 20

(This is Page 16)

You will want a number of these new catalogs and bulletins to bring your information files up-to-date. Simply let us have a short letter on your company letterhead indicating the numbers of the items you want.

(Continued from page 14)

tation Steel". It includes complete technical data and text and illustrations of fabricating operations and finished products. Applications include buses and light trucks, power shovels and cranes, ship-building, mining equipment, etc. Jones & Laughlin Steel Corp., Pittsburgh 30, Pa.

☐ **32. HANDLING ROLL STOCK**—Roll truck with clamp for handling roll stock with easy speed, and practically no damage, lifting loads 17½ ft. for extra high tiering (with substantial savings) is subject of Reporter No. 8 just released by Elwell-Parker Electric Co., Cleveland, Ohio.

☐ **33. MEASURING MACHINE**—Standard Measuring Machine which reads directly to .00001" with controlled measuring pressure is described in detail in new bulletin. Machine is used for checking gages, tools and parts for diameter, length, roundness, straightness, parallelism and taper. Machines are available in 12", 24", 36", 40" and 80" capacities. Pratt & Whitney, West Hartford 1, Conn.

☐ **34. CHEMICAL PUMPS**—Bulletin W-350-B11 describes and illustrates centrifugal pumping equipment used in the chemical process industries, giving complete explanation of mechanical seal especially designed to prevent leakage of corrosive liquids, and also describes Worthite corrosion resistant metal. Worthington Pump & Machinery Corp., Harrison, N. J.

☐ **35. TOOL, HIGH Speed Steels**—"The Working of Tool and High Speed Steels" is title of 16-page booklet which, beginning with a simple selector chart, tersely gives procedures and tabulations that form a working manual for makers and users of cutting tools and dies. It is known as the Blue Sheet, and is designed for use with other Blue Sheets detailing the properties of each type of tool and high speed steel. Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.

☐ **36. COMBUSTION CONTROLLERS**—Controllers for precise, automatic control in industrial processes which utilize heat are subject of illustrated bulletin which also explains Gradiation heating principle. Selas Corp. of America, Philadelphia 34, Pa.

☐ **37. TWO STAGE PUMP**—New two-stage pump, Type TL, available in various sizes is described in Bulletin 246. Capacities to 825 gpm; total head feet to 800. Features assure efficient operation, long life and low maintenance cost. Warren Steam Pump Co., Inc., Warren, Mass.

☐ **38. PRE-FINISHED METALS**—Data folder describes properties, tempers and finishes of pre-finished metals available in brass, zinc, aluminum, copper and steel bases in bright and satin finishes in wide selection of striped, crimped and corrugated patterns. Protective surfaces are also described. American Nickeloid Co., Peru, Ill.

☐ **39. MILLING MACHINES**—Picture-book type of catalog covers Hydromatic Milling Machines, plain and duplex. These are heavy duty fixed bed manufacturing types, developed primarily for quantity production of identical parts. Table is hydraulically actuated. Cincinnati Milling and Grinding Machines, Inc., Cincinnati 9, Ohio.

☐ **40. CONCRETE FLOOR** — The Masterplate Iron-Clad Concrete Floor is described in 36-page illustrated booklet. The Masterplate Floor with its iron armored surface about ⅛" thick is said to wear at least 5-6 times longer than a plain concrete floor, to be spark resistant, non-dusting, corrosion resistant and easy to clean. Master Builders Company, Cleveland 3, Ohio.

☐ **41. STEELS for CASTINGS**—16-page booklet on a series of carbon and alloy steels for castings, fulfills the range of requirements of present standard commercial specifications. It serves as a guide in selection as well as source of data on metal specifications, chemical properties and physical properties. Dodge Steel Co., Tacony, Philadelphia 35, Pa.

☐ **42. SUMP PUMP**—Folder covers new automatic submersible floatless sump pump, describing eight important features of the pump and switch that assure trouble-free operation. Pump is portable and compact. One model meets all requirements, according to Kenco, Inc., Elyria, Ohio.

☐ **43. FLOOR MAINTENANCE**—Cleaning, Sealing and Maintaining floors are discussed in booklet "The Proper Care of Floors". All types of floor surfaces are covered. Chart lists many types of surfaces, and the proper type of cleanser, sealer and maintainer to be used. West Disinfecting Co., 42-16 West St., Long Island City, N. Y.

☐ **44. DIESEL ENGINES** — Diesel engines for stationary installations are described and illustrated in 20-page bulletin No. 4812. The bulletin features numerous installations in municipal and public utility power plants, industrial power plants, office buildings, etc. More than 100 engine specifications are included. Superior Engine Division, National Supply Co., Springfield, Ohio.

☐ **45. SHARPENING CARBIDES**—Circular describes Diamond lapping oil for all types of carbide tool sharpening on diamond impregnated wheels and laps for metal or resinoid bonded wheels or composition wheels, and for wire drawing dies. It is said to solve the problem of loading and glazing of wheels; pressure unnecessary, Wheel life and carbide life increased. Stadoil Manufacturing Co., El Monte, Calif.

☐ **46. GAS PUMPS**—Bulletin 31-B-17 covers Type XA gas pumps which are used for boosters or ex-

(Please turn to page 19)

OIC UNION BONNET BRONZE GATE VALVE

GIVES YOU MONEY-SAVING FEATURES YOU'LL WELCOME

This series of OIC valves (Figure nos. 7200, 7202 and 7208) is rated for working pressures of 200 pounds steam at 550°F. — 400 pounds water, oil and gas, non-shock. Union bonnet screwed-end type. Solid wedge rising stem, double-disc rising stem and solid wedge non-rising stem designs. Tapered seats and wedges of OIC copper nickel alloy. You'll find this new valve a money-saver on water, oil, gas, steam or any other service where bronze gate valves are used.

LONGER LIFE—LOWER COST

Scientifically designed, constructed of highest quality materials, accurately machined and thoroughly tested for trouble-free operation.

EASILY SERVICED—LOWER MAINTENANCE

Easy to dismantle and reassemble. Quick inspection and servicing. Easy repacking.

EASIER OPERATION—SAVES TIME

Perfect seating without binding or undue wear. Straight-through flow. Minimum pressure drop.

STRONGER—GREATER SAFETY

Ample wall thicknesses. No dangerous stress concentrations. Leak-proof joints.

OIC
PACE SETTER IN VALVES

0-949-14

SPECIAL INTRODUCTORY OFFER

If you'd like to check this OIC bronze 200 lb. union bonnet gate valve, simply send us the size and we'll deliver you a sample on memo billing. Inspect it, analyze it, take it apart, test it. At the end of 30 days, if you're not convinced of its superiority over any comparable valve you've ever used, return it for full credit.

THE OHIO INJECTOR CO.
110 Pine St. WADSWORTH, OHIO

BRONZE • IRON • CAST STEEL • FORGED STEEL

"Courteous treatment by salesmen" . . . that's only one of the things we mean by Service Plus!

BARS · PLATES
STRUCTURALS · SHEETS
STRIP · REINFORCING BARS
* * *
STAINLESS
ALLOY STEELS
ALUMINUM
* * *
TOOLS · EQUIPMENT
MACHINERY

● A recent survey of our customers impressed us again with the fact that "a company is only as good as its personnel!" Many customers told us that they like to do business with United States Steel Supply Company because of the courteous attention they receive from our salesmen. We're glad their efforts are appreciated and we assure you that every order you place, large or small, will receive prompt, courteous attention from men who know their business.

Service Plus is our pledge to handle your order as you want it handled. Our capacity to serve you includes a complete range of steel products, an unrivaled reputation for prompt delivery, and years of experience in providing the most complete steel service available.

WHEN YOU DEAL WITH US, YOU GET Service Plus!

UNITED STATES STEEL SUPPLY COMPANY

Warehouses: BALTIMORE · BOSTON · CHICAGO
CLEVELAND · LOS ANGELES · MILWAUKEE · MOLINE, ILL. · NEWARK · PITTSBURGH
PORTLAND, ORE. · SAN FRANCISCO · SEATTLE · ST. LOUIS · TWIN CITY (ST. PAUL)
Also Sales Offices at: KANSAS CITY, MO. · PHILADELPHIA · TOLEDO · TULSA · YOUNGSTOWN
• Headquarters Offices: 208 S. La Salle St.—Chicago 4, Ill.

UNITED STATES STEEL

ALSO, be sure to check the Bulletins and Catalogs Listed on Pages 12, 14, 16 and 20

(*Continued from page* 16)

hausters. Units are built in 18 standard sizes with capacities ranging from 5 to 620 cfm at pressures up to 2 lbs., from 5 to 320 cfm up to 4 lbs., and from 5 to 175 cfm up to 6 lbs. Pumps handle hydrogen, oxygen, CO^2 and many other gases. Roots-Connersville Blower Corp., Connersville, Ind.

☐ **47. MATERIAL HANDLING** — The Rol-Away truck for handling sheet metal, plate glass, plywood plasterboard, pipe, tubing, and long or large flat-cased materials, is described in new circular. Advantages include one man operation, space saving, light weight, and safety. Honeyman Mfg. Co., 1217 N.W. Everett St., Portland, Ore.

☐ **48. SLING SLEEVE**—New tapered sleeve splice eliminates need for splicing sling loops, and at less than what it costs to do it. Rolled loop and single tapered sleeve provide greater flexibility and compactness, developing full catalog strength of performed "Blue Center" steel wire rope sling. Folder describes splice. John A. Roebling's Sons Co., Trenton 2, N. J.

☐ **49. PHOTO-COPYING MACHINE**—Production speed of three prints a minute features new Foto-Flo copying machine; controlled developing time 45 seconds per print. Complete daylight operation. Makes prints up to 18" wide by 24" long. New Bulletin describes the Model C Photo-Copying Machine. The Haloid Co., Haloid St., Rochester, N. Y.

☐ **50. CYLINDERS**—Air and hydraulic cylinders for operating pressures to 1500 psi, are subject of catalog which contains complete engineering data for Hydro-Line hydraulic cylinders, high and low pressure, and Hydro-Line air cylinders. Catalog is designed to help select and specify size and type of cylinder best suited for the job at hand. Hydro-Line Manufacturing Co., 711 19th St., Rockford, Ill.

☐ **51. EYELET MACHINES** — Industrial line of eyelets and eyeleting machines are subject of 50-page catalog. Standardized eyelets are described and illustrated along with specialized types suitable for use in canvas, cloth, plastics, rubber, paper, cardboard and other materials. Machinery and accessories section includes two new machine models and would be of value to concerns making assemblies involving dual-use fastenings, vents, bushings or bearings. United Shoe Machinery Corp., 140 Federal St., Boston 7, Mass.

☐ **52. AIR VALVE**—Six-page bulletin describes the "Hi-Cyclic" air valve which functions the same as any ordinary operating valve yet

(*Please turn to page* 20)

At Your Service!

The Latest Trade Literature

About 75 new Catalogs and Bulletins on industrial Products, Equipment and materials are described on pages 12, 14, 16, 19 and 20. You will need a number of them to bring your Catalog file up-to-date, or to refer to various department heads.

NEW PRODUCTS (Pages 148 — 180)

Also, you will find a large number of news items on New Products, Equipment and Supplies in the New Products Section.

PURCHASING'S Reader Service

ALL of these items include the names and addresses of the manufacturers, enabling you to write direct to them for additional information or printed matter.

However, each item is Numbered. So, if you want to save multiple letter writing, just jot down the numbers of the items you are interested in, and list them in a letter on your COMPANY Letterhead to our Reader Service Department. We will see that the material is sent to you promptly.

PURCHASING *Magazine*

205 East 42nd Street, New York 17, N. Y.

The LATEST Trade LITERATURE

Check over all Five Pages — 12, 14, 16, 19 & 20

(This is Page 20)

You will want a number of these new catalogs and bulletins to bring your information files up-to-date. Simply let us have a short letter indicating the numbers of the items you want. Your request will be handled promptly.

(Continued from page 19)

provides complete control of air cylinder action. Valve will control stroke of air cylinder within .001", control speed of stroke, control pressure in both ends of cylinder, and effect big savings in air. Models discussed are available with standard U. S. pipe size ports ranging from ⅛" to 1". The Beckett-Harcum Co., Wilmington, Ohio.

☐ **53. PIPE THREADER**—Bulletin details portable Model-C power threader. Model C-2 may be had with or without vice. Safety latch prevents rotation of pipe handle. Complete catalog available. Beaver Pipe Tools, Inc., 310 Dana Avenue, Warren, Ohio.

☐ **54. CHROME PLATING**—Divco 71-point anodes are claimed to give increased chrome plating efficiency; 7 edges give unusual throwing power; 15.5 square inches of contact surface per inch of length. Technical Bulletin 8A gives full details. Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.

☐ **55. INDUSTRIAL LIGHTING**—A Planned Lighting Equipment Selection Guide covering the application of 12 basic industrial lighting systems for general lighting contains Selection Chart which enables one to see at a glance the application of each of 12 Benjamin lighting systems, covering practically every illumination requirement from 10 to 150 footcandles. Separate chart shows lighting for combustible, dusty or damp atmosphere. Benjamin Electric Manufacturing Co., Des Plaines, Ill.

☐ **56. CENTRIFUGAL PUMPS**—Centrifugal Pump Installation and Operating Manual, Bulletin 812A covers use of such pumps in corrosive service. While dealing with Durco pumps the information is applicable to all centrifugal pumps. The Duiron Co., Inc., Dayton 1, Ohio.

☐ **57. LARGE DIE CASTINGS**—"How large is a die casting"? is title of bulletin with reprint dealing especially with diecasting automobile inner door frames in aluminum. It is emphasized that there is no physical limitation to the length, width, depth or weight of a die casting. Doehler-Jarvis Corp., 386 Fourth Ave., New York, N. Y.

☐ **58. WIRE ROPES**—Stainless steel and monel metal wire ropes for use where corrosion affects uncoated carbon steel and galvanized ropes are subject of folder which catalogs 133 different sizes and types of these ropes. Typical uses for each rope are listed. Macwhyte Company, Kenosha, Wis.

☐ **59. PROTECTING WOOD**—Six-page bulletin T-49 tells how to protect wood from insect attack. Illustrations and text explain termite habits and termite infestation, tell how to save wood already infested. Powder-post beetles and dry wood termites and their control are also discussed. Chapman Chemical Co., Dermon Bldg., Memphis 3, Tenn.

☐ **60. FORGING - BENDING**—Heat processing machines for forging and bending operations are claimed to make for substantial reductions in cost. Bulletin tells about the Selas Gradiation heat processing machines which make for better metal flow and faster production rates, as well as higher forging and bending quality. Selas Corp. of America, Philadelphia 34, Pa.

☐ **61. BROACHES**—Glenny push broaches and eccentric adapters are subject of Catalog No. 12. Keyways cut on production and special job basis are illustrated. 32 standard sizes are listed, and complete broach kits are listed with full specifications for broach sizes, interchangeable cutting blades, and eccentric adapters. Kase Machine Co., 18439 Buffalo Ave., Cleveland 19, Ohio.

☐ **62. ZINC PLATING** — Bright Zinc Plating in Barrels is subject of manual on process that features high brightness, low operating cost, and excellent covering power; special equipment not required. Hanson-Van Winkle-Munning Co., Matawan, N. J.

☐ **63. CONTROLLERS**—New instruments for automatically controlling temperatures, pressure, flow, liquid level, humidity, and pH value, are detailed in Bulletin A120 covering the company's new line of Series 500 air-operated controllers. Bulletin is liberally illustrated. The Bristol Company, Waterbury, Conn.

☐ **64. RING PACKING**—Palmetto ring packing for reciprocating, static, and special applications, are subject of Technical Bulletin, TB 918. It consists of a resilient sealing ring of synthetic rubber in a T-section backed up or supported by laminated phenolic retainers or guards. Packing may be used in any hydraulic or pneumatic system where positive seal is necessary. It is supplied in two styles—external or piston type seal, and internal or rod type seal. Greene, Tweed & Co., North Wales, Pa.

☐ **65. GEARS**—Handy gear tooth calculator is yours for the asking. Numbers on outer edge of this circular device represent diametral pitch of gear. By turning cut-out section to desired number, figures appearing in the space show circular pitch, circular thickness, addendum, and the whole depth. Perkins Machine & Gear Co., West Springfield, Mass.

☐ **66. CASTINGS** — Malleable iron castings are subject of brochure which describes the advantages they offer, and facilities of the company for design, service and production. Company is equipped for volume production of castings from fraction of a pound to 200 pounds. Maumee Malleable Castings Co., Toledo, Ohio.

☐ **67. FIRE EXTINGUISHER**—Dry-chemical fire extinguisher, said to be completely water-tight, known as Model B, available in 20 and 30 lb. sizes, is subject of Bulletin just released by Ansul Chemical Co., Marinette, Wis.

Zenith · Martin Aircraft · Econ-O-Seal · Norge · Fisher Body · Belmont Radio · GE · GM · American Kelvinator · Nash · Firestone · Ford · Evinrude · Bell Aircraft · Enka · Imperialite · Crosley · Celanese · Stewart-Warner · Du Pont · Capehart · The DeVilbiss Co · International · Monarch Ranges · Fulton · Willys · Johnson Motors · Douglas · Philco · Emerson · Studebaker · RCA Victor · Globe American Corporation · Kiekhaefer Mercury · Silex · Oldsmobile · Diamond T · The Lauson Company · Bell & Howell · Deepfreeze · A-B Stove · Perfection Stove Company · Sperry Gyroscope Co · Westinghouse · Admiral · Binks · Servel · American-Bosch · Western Electric Company · Kodak · Frigidaire · Mallory · North American Rayon · Bendix

IT'S A Great GANG...

AND WE'D LIKE YOU TO JOIN THEM!

A *company,* too, is known by the company it keeps. The names you see, here, are but a few of the many leaders, in many industries, who have found a common meeting point in their purchase of aluminum component parts from our Contract Division.

These manufacturers, knowing the importance of assured dependability in fabrications selected for their various assemblies, have confidently placed their reputations in our keeping. That each is impressively outstanding in its field clearly testifies to the fact that our share in their diverse products contributes consistently to manufacturing and selling success.

Our engineering, design, metallurgical, fabricating, and finishing departments are at your service, whenever you say the word. We suggest that you wire or write for complete information.

CONTRACT DIVISION

ALSO MAKERS OF
MIRRO
The Finest Aluminum Cooking Utensils

ALUMINUM GOODS Manufacturing Company

MANITOWOC WISCONSIN

FIFTH AVENUE BLDG., NEW YORK 10 MERCHANDISE MART, CHICAGO 54

Model No. 214A. Cuts up to 14 gauge hot rolled steel at speeds up to 20 feet per minute.

Cheaper by the foot to cut sheet metal with STANLEY UNISHEARS

You can easily cut more feet of sheet metal per man-hour with Stanley Unishears . . . so each foot of cutting costs you less. Models to cut 18 ga., 16 ga., 14 ga., 12 ga., 10 ga., 8 ga., and 6 ga. Speeds, according to gauge, up to 20 feet a minute. Portable models easier to handle than snips. Make smooth cuts on straight work, curves, angles, notches . . . inside or out. Blades replaceable and easily resharpened. Full anti-friction bearing construction.

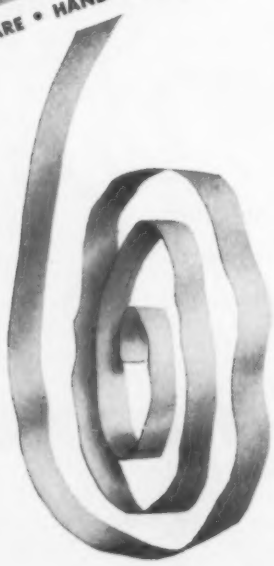
This trade mark on electric tools tells you the most important thing you want to know about tools

STANLEY

Reg. U. S. Pat. Off.

HARDWARE • HAND TOOLS • ELECTRIC TOOLS • STEEL STRAPPING

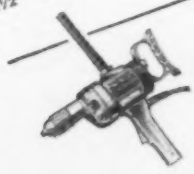
When you buy an electric tool you have to take somebody's word about gears, motor, bearings, shaft, switches, power, etc. Whose word about tools could be more reliable than the word of "Stanley"—tool makers for over 100 years. On an electric tool the name Stanley means the tool is quality built, thoroughly tested and honestly rated. Covered by a generous guarantee and serviced by a network of Stanley Service Stations. See your dealer or write for complete catalog. Stanley Electric Tools, 485 Myrtle Street, New Britain, Connecticut.



Bench Grinders: Wheel capacities, 6" x ½", 6" x ¾", 7" x 1" and 10" x 1".

Safety Saws: Capacities from 2½" to 3¼".

Electric Hammers: Capacity, 1⅛" in concrete.



Electric Drills: ⅜", ¼", 5/16", ½", ⅝", ¾", and 1" in steel.

STERLING BOLT

stove bolts

complete range of sizes • package or bulk • steel and brass • all head styles

Sterling Bolt One-Source Service will provide you with your stove bolt needs—and all your other metal fastening needs—enabling you quickly and economically to obtain the bolts that meet your specifications. Complete range of sizes, all head styles, steel and brass, packages or bulk. *Call the Sterling Bolt man* for stove bolts and for every other metal fastening requirement.

PHONE, WIRE, TELETYPE OR WRITE TODAY!

Send for your FREE catalog TODAY

Thumb indexed for quick reference.
Packed with valuable engineering and technical information.
Two hundred thousand items.
One hundred twenty-four pages.
Set in large, easy to read type.

STERLING BOLT COMPANY
201 W. JACKSON BOULEVARD
CHICAGO 6 • TELETYPE CG-488
TELEPHONE HARRISON 7-9880

SALES OFFICES:
Union Trust Bldg., Cincinnati 2, Ohio • 17 W. Market St., Indianapolis 4, Ind.
161 W. Wisconsin Ave., Milwaukee 2, Wis. • 1228 N. Hadley St., St. Louis 6, Mo.

STERLING BOLT COMPANY
201 W. Jackson Blvd., Chicago 6, Illinois

Please send me without obligation your new easy-to-use catalog.

NAME_____

POSITION_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

Want Additional Product Information? See Page 19.

. . . for over 80 years Chain for Every Use!

Since 1869 — THE OLDEST NAME IN CHAIN — ROUND

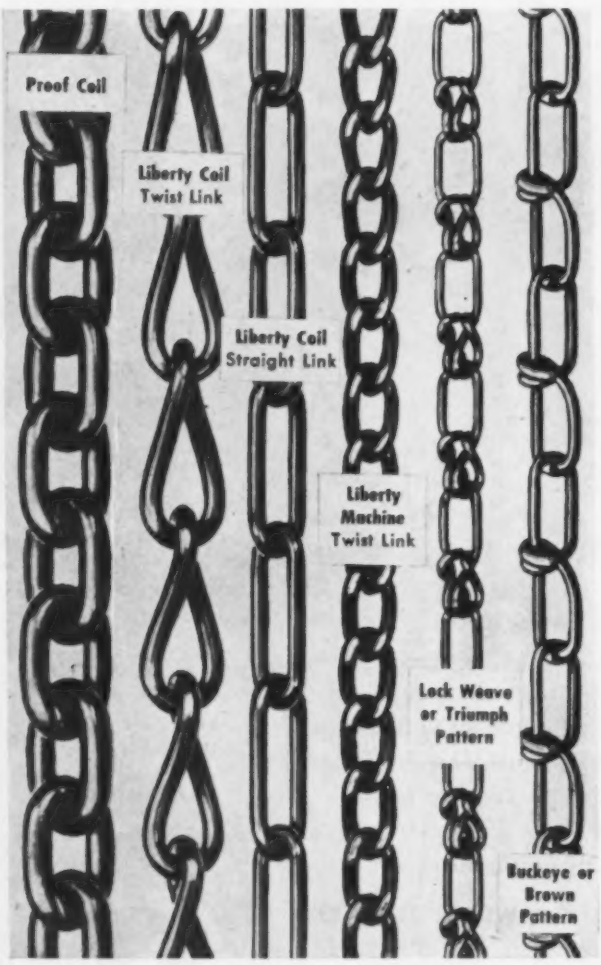
Throughout the world, the name ROUND has stood for first quality chain for over 80 years.

For greatest safety and dependability, specify ROUND Chain on jobs where strength and long life are essential. Five large plants manufacture chain of every type and size, guarantee prompt handling of your orders. A-2657

Write for catalog, today!

ROUND Sling Chains are safest for hazardous lifting. Test Certificate furnished with each chain.

ROUND Magnet Chains resist wear, provide security in every link.

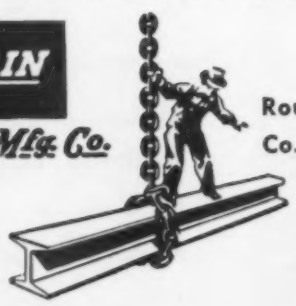


There's a special ROUND chain for every purpose . . . precision manufactured . . . carefully tested . . . with security in every link.

Sling Chain
Available in any length. Single — double — 3 way — 4 way or in any desired pattern.

CLEVELAND CHAIN

The Cleveland Chain & Mfg. Co.
Cleveland 5, Ohio



Round Associate Companies: The Bridgeport Chain & Mfg. Co., Bridgeport 1, Conn. • **The Cleveland Chain & Mfg. Co.,** Cleveland 5, Ohio • **Round California Chain Co.,** So. San Francisco and Los Angeles 54, Cal. • **Seattle Chain & Mfg. Co.,** Seattle 8, Wash. • **Woodhouse Chain Works,** Trenton 7, N. J.

Want Additional Product Information? See Page 19.

Right for the job and priced right!

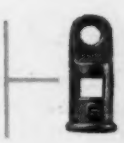
There's nothing sensationally "tricky" about this pipe hanger. It's just the most practical and inexpensive way of hanging pipe for a great many jobs. Complete assembly includes a split pipe ring and socket, rod, extension piece and universal I-beam clamp. Available for pipe from ½" to 8", for loads from 75 to 1510 lbs.

It is well worth remembering that a good piping job is too important to jeopardize with improvised or inadequate pipe hangers and supports. You can get from Grinnell just the right pipe hanger for any job within the shortest possible time at the lowest cost consistent with quality.

Grinnell has the most complete line of pipe hangers, extensive manufacturing facilities, warehouses across the country, and jobbers in almost every city and town.

UNIVERSAL SIDE I-BEAM MALLEABLE IRON CLAMP (Fig. 225) . . . Used on American Standard I-beams as well as wide flange beam sections. One of 10 different Grinnell I-beam clamps to meet varying specifications.

MALLEABLE IRON EXTENSION PIECE (Fig. 157) . . . Bolts into Universal Side I-beam Clamp (Fig. 225) and other malleable iron clamps to receive hanger rod. Provides for adjustment of rod.



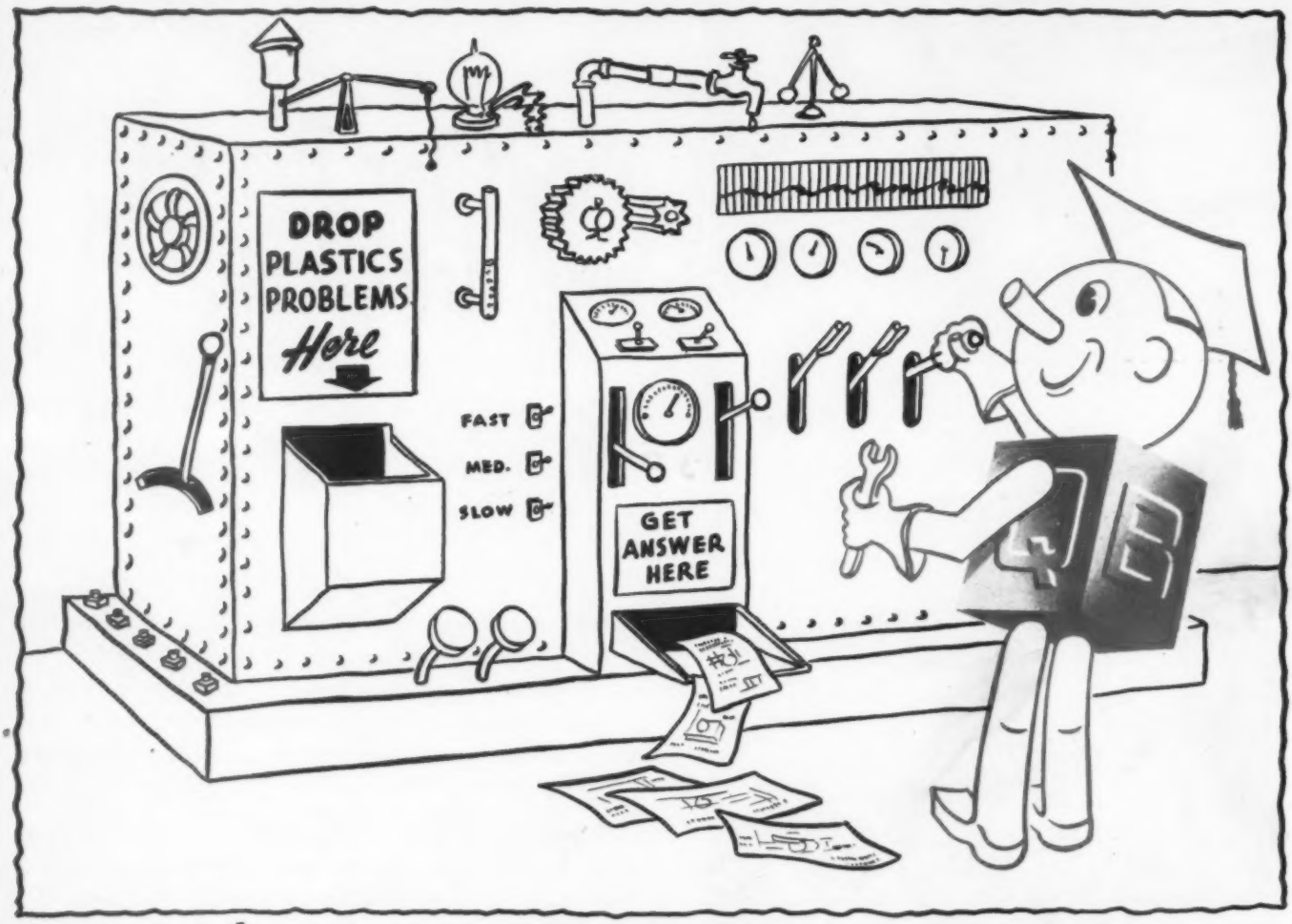
MALLEABLE IRON SPLIT PIPE RING AND SOCKET (Fig. 107R)...Once hanger rod is turned to proper adjustment and the attached half of the ring is snugged against the pipe, the other half of the ring is swung up into position and bolted. For 13 pipe sizes, ½" to 8", for loads from 75 to 1510 lbs.

100th ANNIVERSARY — WHEREVER PIPING IS INVOLVED

GRINNELL

Grinnell Company, Inc., Providence 1, R. I. Warehouses: Atlanta • Buffalo • Charlotte • Chicago • Cleveland • Cranston • Fresno • Kansas City • Houston • Long Beach Los Angeles • Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Pocatello • Sacramento • St. Louis • St. Paul • San Francisco • Seattle • Spokane

Want Additional Product Information? See Page 19.



It isn't as easy as this ... BUT "CUBEE"

GETS THE ANSWER TO YOUR PLASTICS PROBLEMS!

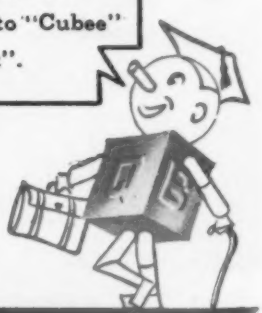
Nope it isn't that easy—it takes lots of planning and designing and figuring before most problems are solved. But we've enjoyed great success at satisfying our clients just the same.

We know that, in order to help you, with your problems, we must have knowledge of materials, design, die-making, production and all the rest. We have those facilities—all under one roof—you see we're specialists in molding plastics parts—from design to finished product.

Call "Cubee" the next time you have a problem in design. We think we can help you.

Q-B Says:

"When you're planning in Plastics
And you want the very best
Give your problems to "Cubee"
And we'll do the rest".



QUINN-BERRY CORP.
2672 West 12th Street
ERIE, PENNSYLVANIA

Quinn-Berry Corp.

PLASTICS

Branch Offices

MR. HARRY R. BRETHEN
11341 Woodward Avenue
Detroit, Michigan
Townsend 8-2577

MR. W. A. HURTIENNE
4753 Broadway
Chicago 40, Illinois
Longbeach 0028

PARAGON SALES COMPANY
111 S. 22nd Street
Philadelphia 3, Pennsylvania
Rittenhouse 6-5699

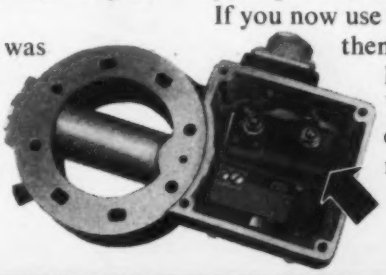
How

MICRO SWITCH ENGINEERING

can boost your profit by improving your product...

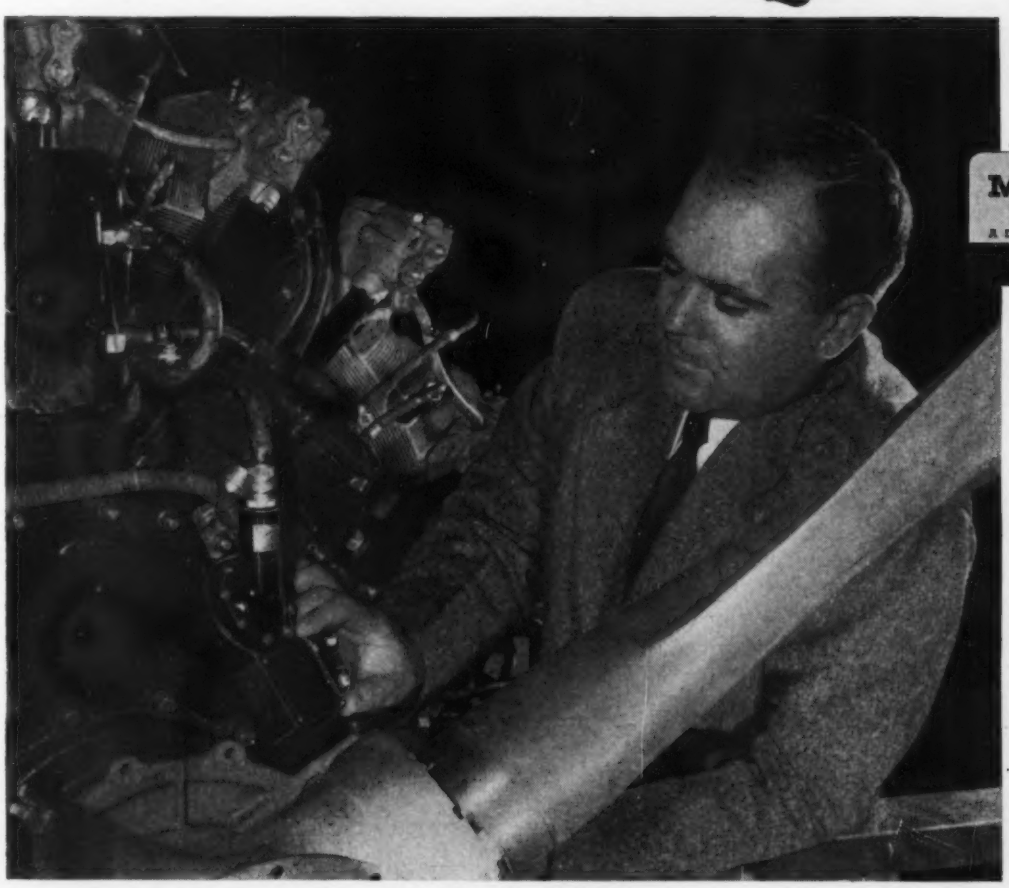
This dramatic little story of how MICRO SWITCH ENGINEERING overcame a seemingly insuperable obstacle may hold a valuable profit lesson for *you.* A manufacturer of aircraft torque pressure switches was baffled by the inability of standard snap-action switches (the operating element) to withstand the extreme engine vibration. Thus his device could not invariably perform its function of feathering aircraft propellers instantly in event of engine failure.

But MICRO SWITCH ENGINEERING was called in, and—from an unequalled experience in handling comparable problems—a special precision switch was developed to meet the exacting requirement perfectly!



This very ingenuity, this skill and experience already responsible for the development of over 4600 different types of precision switches by the MICRO SWITCH ENGINEERING staff—*all this is yours to command!* Simply consulting with MICRO engineers may easily lead to amazing results in improving your present product, or in designing new products that may increase your profits, cut your costs, or both!

If you now use precision switches, or contemplate using them, you and your design people should know what MICRO SWITCH ENGINEERING can do for you. Write or call MICRO SWITCH, Freeport, Illinois, or the nearest branch office.



MICRO MS SWITCH

A DIVISION OF FIRST INDUSTRIAL CORPORATION

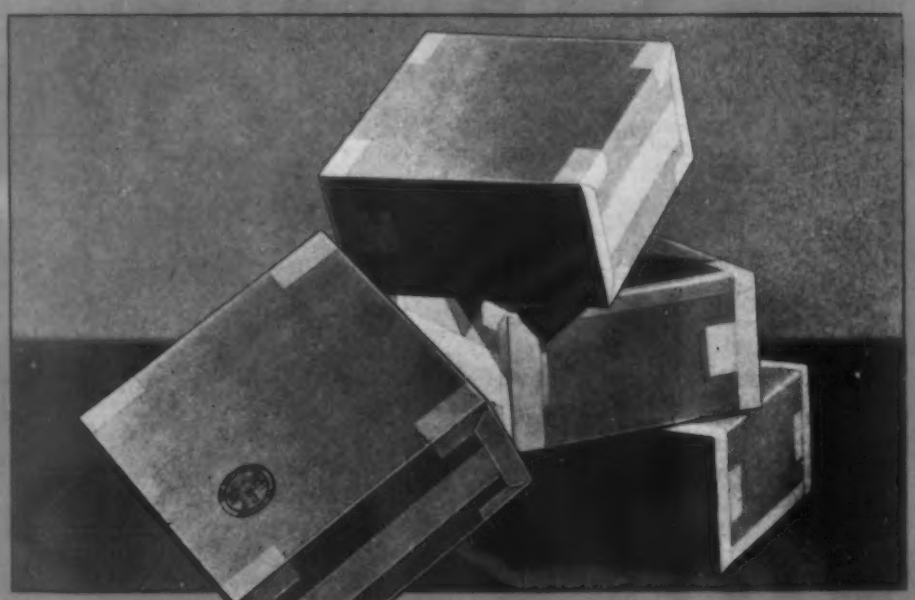
FREEPORT ILLINOIS, U.S.A.

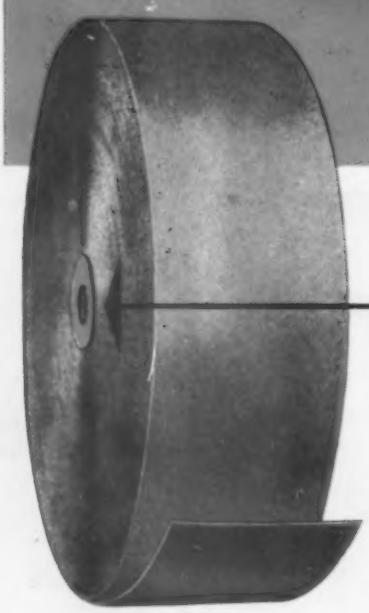
Branches: Chicago • New York
Boston • Cleveland • Los Angeles

Representatives: Portland
St. Louis • Dallas • Toronto

MICRO...
first name in precision switches

ORANGE CORE holds tight*





*another reason why

ORANGE CORE GUMMED TAPE

is the largest selling tape in the world

Orange Core gummed tape combines long-fibered kraft with a high quality adhesive to seal cartons and parcels efficiently. Its tight hold hardens into a secure bond to protect merchandise both in transit and storage. It remains intact under stress, strain, and humidity conditions. Orange Core gummed tape stands abuse, and can reduce traffic claims appreciably. It will guard against pilferage, dust, and humidity changes. This famous standard tape is available in all standard weights, widths, lengths, colors, and either plain or imprinted with your advertising message.

A gummed tape of exceptional quality. Orange Core is under constant laboratory control from tree to finished tape. This assures you of absolute uniformity at all times. If you have a special tape requirement, consult with any Orange Core distributor.

Send for
comprehensive folder explaining the advantages of Orange Core gummed tape, and including sample of this excellent sealing tape. Ask for folder titled: "The Mark of a Better Tape!"

GUMMED TAPE...

"The only closure that does so much for so little."

ORANGE CORE
Copyr. H. P. & P. Corp.
GUMMED SEALING TAPE

Hudson Pulp & Paper Corp., Dept. Q-1, 505 Park Ave., New York 22, New York

What's different about this sign?

ATTRACTIVE aluminum signs like this, printed by silk screen process, are familiar sights on the West Coast today. They provide a typical example of the customer service given by Kaiser Aluminum Distributors. Read why . . .

First of all, it's printed on Kaiser Aluminum, instead of paper. Which means it's weatherproof, washable, long-lasting, eye-catching, more economical.

But more important to *you*... this sign is the product of close collaboration between a San Francisco Kaiser Aluminum Distributor and Fielder, Sorensen & Davis, a leading West Coast transit advertising firm.

Your Kaiser Aluminum Distributor can help *you* to greater profits, too. He'll stock your warehouse requirements in standard or special sizes. He'll help you work out a program to make your inventories versatile, your materials investment lower, your handling costs less, your space requirements smaller.

He's ready to give you expert engineering help!

For outstanding warehouse service call your Kaiser Aluminum Distributor today!

Kaiser Aluminum is produced by Kaiser Aluminum & Chemical Corporation.

YOUR

Kaiser Aluminum

DISTRIBUTOR

FOR WAREHOUSE QUANTITIES, CALL YOUR LOCAL KAISER ALUMINUM DISTRIBUTOR

ATLANTA, Georgia
Morrison-Drabner Steel Co.
82-84 Milton Avenue
Alpine 4885

BALTIMORE, Maryland
The Hill-Chase Steel Company of Maryland
6311 Erdman Avenue
Peabody 7300

CINCINNATI, Ohio
Morrison-Drabner Steel Co., Inc.
1074-1084 Summer Street
Wabash 4480, 4481

CLEVELAND, Ohio
Nottingham Steel Company
West 45th St. & Division Ave.
Atlantic 5100

DETROIT, Michigan
Cauhorn Distributing Company
9999 Broadstreet
Hogarth 3858

Copper & Brass Sales, Inc.
3000 East Woodbridge
Lorain 7-3380

EVANSTON, Illinois
Korhumel, Heffron & Preiss Steel Co.
2424 Oakton Street
Ambassador 2-6700

FRESNO, California
Clingan & Fortier, Inc.
1960 H Street
Phone 2-2164

HONOLULU, T. H.
Permanente Cement Co.
Pier 32, P. O. Box 79
Telephone 5-2541

INDIANAPOLIS, Indiana
F. H. Langsenkamp Company
229 East South Street
Riley 9311

KANSAS CITY, Missouri
Industrial Metals, Inc.
403 East 18th Street
Victor 1041 or Victor 1042

LOS ANGELES, California
Permanente Products Company
Warehouse Division
551 East Macy Street
Mutual 7286

MILWAUKEE, Wisconsin
KHP Milwaukee Steel Company
1550 South First Street
Evergreen 3-5800

MINNEAPOLIS, Minnesota
Korhumel, Heffron & Preiss Steel Co.
3225 Como S. E.
Gladstone 5943

NEW ORLEANS, Louisiana
The Orleans Steel Products Co., Inc.
1019-1025 Bienville Street
Raymond 2116

NEW YORK, Metropolitan Area
A. R. Purdy Company, Inc.
Page Avenue & Orient Way
Lyndhurst, New Jersey
Lyndhurst: Rutherford 2-8100
New York: Chelsea 3-4455
Newark: Humboldt 2-5566

OAKLAND, California
Gilmore Steel & Supply Company
1960 Cypress
Glencourt 1-1680

OMAHA, Nebraska
Gate City Steel Works
11th and Seward
Atlantic 1830

PHILADELPHIA, Pennsylvania
Hill-Chase & Company, Inc.
Trenton Ave. & Ontario St.
Delaware 6-5400

PHOENIX, Arizona
Arizona Hardware Co.
47 E. Jackson Street
Phone 3-3111

PORTLAND, Oregon
Eagle Metals Company
809 Dekum Building
Atwater 4962

SAN FRANCISCO, California
Clingan & Fortier, Inc.
1526 Wallace Street
Mission 7-0206

Gilmore Steel & Supply Company
840 Brannan Street
Klondike 2-0511

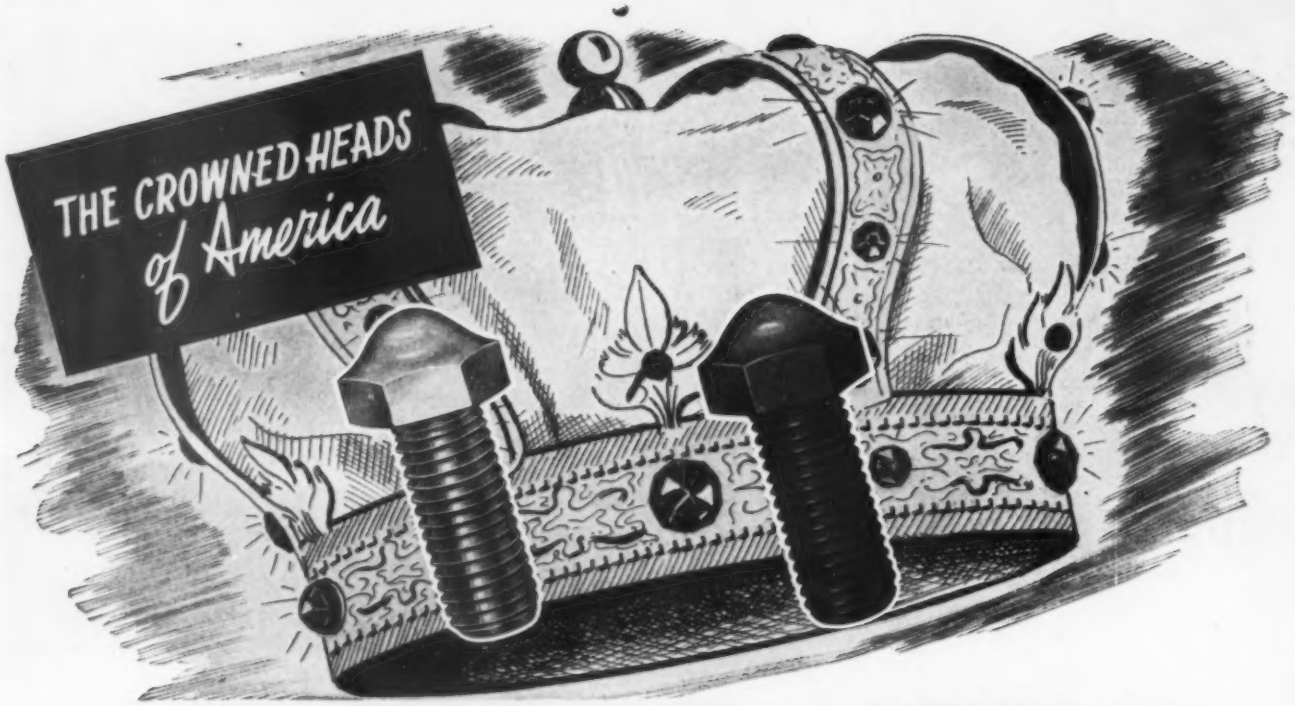
SEATTLE, Washington
Eagle Metals Company
3628 East Marginal Way
Eliot 4764

SPOKANE, Washington
Eagle Metals Company
E. 41 Gray Street
Main 2419

WICHITA, Kansas
General Metals Mfg. Co., Inc.
218-220 South Wichita
3-4314, 3-2373

KAISER ALUMINUM & CHEMICAL SALES, INC., KAISER BLDG., OAKLAND, CALIF. • OFFICES IN MAJOR CITIES

Want Additional Product Information? See Page 19.



SHINYCROWNS

THE KING OF HEX HEADS

A Crowning Achievement in Cap Screw Design

FOR GENERAL USE

SHINYCROWNS give that "New Look" to assembly where appearance, ultra-quality, and sales interest are paramount. For that "finishing touch" to your assembly, specify SHINYCROWNS, the last word in ornamental Hexagon Head design.

SHINYCROWNS are furnished in C-1018 steel, in sizes ¼" diameter through ½" diameter inclusive, in both coarse and fine threads, in plain, zinc, cadmium, nickel, or chrome plate. Price governed by quantity desired—bulk shipments only.

SPECIAL NOTE: Also furnished with polished crown to secure highest possible luster, mirror finish.

FOR SPECIAL USE

SHINYCROWNS - HexHard have that "New Look" appearance with the added features of hard Hexagon Heads and soft, tough threads obtained by a special heat treatment—for use where tightening and loosening for adjustment purposes is necessary.

SHINYCROWNS - HexHard are furnished in special heat treating material to secure the above features, in standard sizes ¼" diameter through ½" diameter inclusive, in both coarse and fine threads, in plain, zinc, cadmium, nickel, or chrome plate. Price governed by quantity desired — bulk shipments only.

SPECIAL NOTE: Also furnished in ⅜" diameter special 20 thread where specified.

SHINYCROWNS - HexHard with hard Hexagon Heads are recommended to eliminate poor wrench fit resulting in rounded corners from constant adjustment.

Complete Information and Samples furnished on request.

The FERRY CAP & SET SCREW Co.

SCRANTON ROAD • • • • • CLEVELAND 13, OHIO

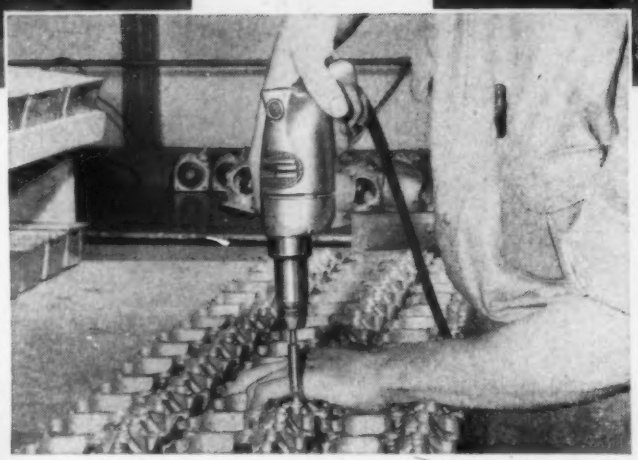
Pioneers and Recognized Specialists Cold Upset Screw Products since 1907

CAP AND SET SCREWS • CONNECTING ROD BOLTS • MAIN BEARING BOLTS • SPRING BOLTS AND SHACKLE BOLTS • HARDENED AND GROUND BOLTS
SPECIAL ALLOY STEEL SCREWS • VALVE TAPPET ADJUSTING SCREWS • AIRCRAFT ENGINE STUDS • ALLOY STEEL AND COMMERCIAL STUDS • FERRY PATENTED ACORN NUTS

DRILLS • BENCH GRINDERS • PORTABLE GRINDERS • DIE GRINDERS • SANDERS • POLISHERS • SCREW DRIVERS • NUT RUNNERS • ELECTRIC IMPACT WRENCH • TAPPERS • ELECTRIC HAMMERS • ELECTRIC SHEARS • ELECTRIC SAWS • DRILL STANDS • HOLE SAWS • WIRE BRUSHES • HAMMER TOOLS • SAW BLADES • GRINDING WHEELS •

HOLGUN*

Drills holes up to 1/4" diam. in steel, up to 1/2" in hardwood. Close-coupled, compact, 3/4" spindle offset.



SCRUGUN* ➡

Drives machine screws to 1/4", self-tapping screws to #12, wood screws to #10x2". Positive or adjustable clutch. Handle "free" or "gathering" assemblies.

TAPGUNS*

Cuts threads up to 3/16" in mild steel, up to 3/8" in brass or aluminum. Automatic reversing mechanism, reduces tap breakage.

DRILLS • BENCH GRINDERS • PORTABLE GRINDERS • DIE GRINDERS • SANDERS • POLISHERS • SCREW DRIVERS • NUT RUNNERS • ELECTRIC IMPACT WRENCH • TAPPERS • ELECTRIC HAMMERS • ELECTRIC SHEARS • ELECTRIC SAWS • DRILL STANDS • HOLE SAWS • WIRE BRUSHES • HAMMER TOOLS • SAW BLADES • GRINDING WHEELS •
DRILLS • BENCH GRINDERS • PORTABLE GRINDERS • DIE GRINDERS • SANDERS • POLISHERS • SCREW DRIVERS • NUT RUNNERS • ELECTRIC IMPACT WRENCH • TAPPERS • ELECTRIC HAMMERS • ELECTRIC SHEARS • ELECTRIC SAWS • DRILL STANDS • HOLE SAWS • WIRE BRUSHES • HAMMER TOOLS • SAW BLADES • GRINDING WHEELS •
DRILLS • BENCH GRINDERS • PORTABLE GRINDERS • DIE GRINDERS • SANDERS • POLISHERS • SCREW DRIVERS • NUT RUNNERS • ELECTRIC IMPACT WRENCH • TAPPERS • ELECTRIC HAMMERS • ELECTRIC SHEARS • ELECTRIC SAWS • DRILL STANDS • HOLE SAWS • WIRE BRUSHES • HAMMER TOOLS • SAW BLADES • GRINDING WHEELS •
DRILLS • BENCH GRINDERS • PORTA-

3 How to Cut Costs in ASSEMBLY OPERATIONS

There are four good reasons why these famous *matched* Van Dorn "Power Triplets" cut costs in assembly operations!

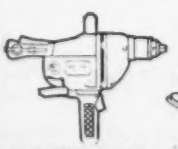
(1) They are perfectly balanced, with "Pistol Grip and Trigger Switch," for easier handling that reduces operator fatigue. (2) They are powered by Van Dorn-built motors, "tailor-made" for the specific tool they drive, for non-stop production. (3) They are engineered to turn out more accurate, more uniform work, with fewer rejects, at lower cost. (4) They are packed with all the strength and stamina Van Dorn builds into every tool, to give you extra years of service for your money.

Ask your nearby Van Dorn Distributor for full details on these cost-cutting assembly tools. And remember, he is always ready to give you expert help in keeping *all* your costs down. Phone him today to arrange an on-the-spot survey of your plant. Write for free catalog to: THE VAN DORN ELECTRIC TOOL CO., 764 Joppa Road, Towson 4, Maryland.

*Trade Mark Reg. U. S. Pat. Off.

"Van Dorn"

Div. of Black & Decker Mfg. Co.

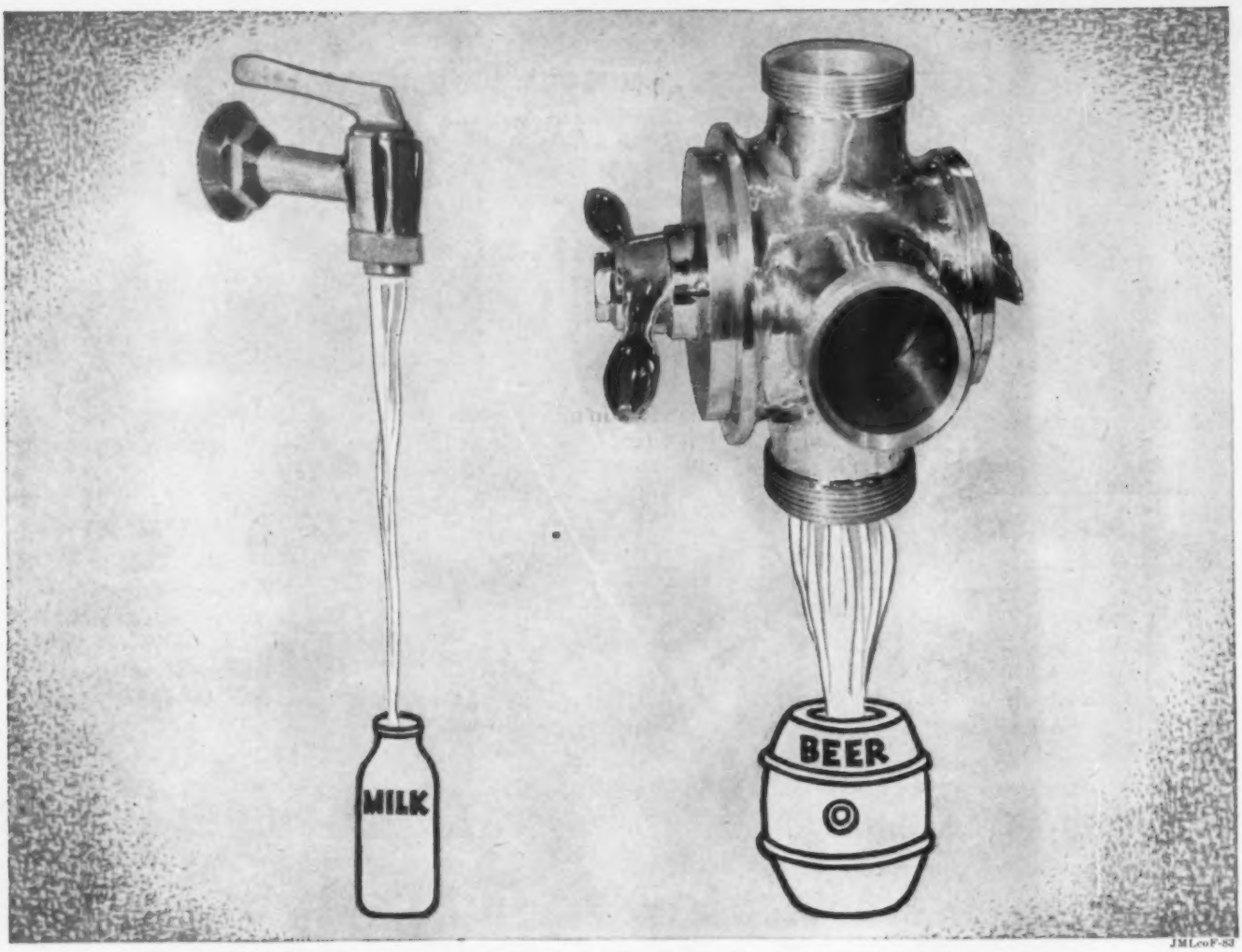


ELECTRIC DRILLS

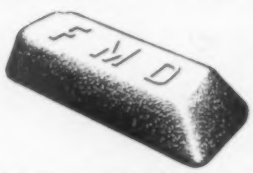
ELECTRIC SANDERS

ELECTRIC SAWS

BENCH GRINDERS



PERFECT METAL–PERFECT CASTINGS!



The small valve is for the dairy industry; the large one for the brewery field. Both are cast of Federated Nickel Silver . . . for very good reason.

Since 1912 the Specialty Brass Company, Kenosha, Wisconsin, has been making castings for dairy equipment. Then, and even more so now, the demands of this food industry forbid the use of castings with even the slightest blemish. Brewery equipment must likewise be virtually perfect.

To produce such castings consistently . . . and to be famous for it . . . Specialty Brass uses the best in methods, and the *best in materials*. Specialty uses Federated Nickel Silver exclusively.

Nickel silver alloys are particularly suited for use where high corrosion resistance and silvery white color are important. Federated metallurgists can tell you exactly what alloy fits your need. They are ready and willing to help out in your foundry, too, should casting problems arise.

For nickel silvers; brasses and bronzes; aluminum and magnesium alloys; solders; babbitts; fabricated lead products; for any non-ferrous metals, see Federated first.

Federated METALS DIVISION

AMERICAN SMELTING AND REFINING COMPANY, 120 BROADWAY, NEW YORK 5, N. Y.

Want Additional Product Information? See Page 19.

Walker-Turner designing makes these

2 NEW PRODUCTION MACHINES

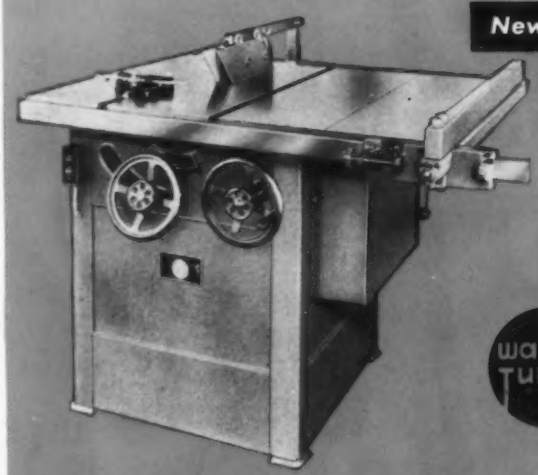
Low in Initial Cost . . . High in Operating Efficiency

INDUSTRY will find what it's looking for in these new Walker-Turner machines—they're built with industry's needs in mind. Increased man-hour productivity . . . greater safety for the operator . . . low initial cost . . . a minimum of maintenance—these were the objectives, the goals that guide Walker-Turner engineers in designing *any* production machine.

Below are just a few of the advanced features of Walker-Turner's completely new 12" Tilting Arbor Saw and 16" Band Saw. Get the whole cost-cutting story from your dealer. Compare these machines—in engineering, performance, *cost*—with others. See why it pays to turn to Walker-Turner for metal and woodworking machines—*today more than ever!*

New 16" BAND SAW

Now, for the first time in a band saw, all the basic parts of the machine are functional. Designed for steady production work, this new Walker-Turner 16" Band Saw frequently will pay for itself on the first job. Single speed models for wood and plastic cutting. 8 blade speeds—with standard motor 193-5692 feet per minute: with slow speed motor 126-3700 feet per minute. Table size 18" x 17".



New 12" TILTING ARBOR SAW

Capacity 4½". Table 48" wide x 38¾" deep. 5 h.p. 3 phase motor or 3 h.p. single phase. Dado capacity 1½" wide. Saw speed 3600 r.p.m. New rip fence locks front and rear, micrometer adjustment "T" slots for miter gauge. New improved safety guard and splitter. Exclusive "Synchro Belt Drive".

walker-turner

SOLD ONLY THROUGH AUTHORIZED DEALERS

SEE YOUR LOCAL DEALER—or mail coupon below for Catalog describing in detail these and the many other machines in the complete Walker-Turner line.

KEARNEY & TRECKER
MILWAUKEE

WALKER-TURNER DIVISION
PLAINFIELD, NEW JERSEY

Walker-Turner Division, Kearney & Trecker Corp.
Dept. P2, Plainfield, N. J., U. S. A.
Please send me copy of the new Walker-Turner Machine Catalog.

Name .....

Position ..... Company .....

City ..... Zone ..... State .....

WALKER-TURNER DIVISION, KEARNEY & TRECKER CORPORATION, PLAINFIELD, NEW JERSEY

STURTEVANT DUSTLESS BLENDERS

Thoroughly Blend Substances into an Inseparable Mass

The 4-Way Mixing Action of the Sturtevant Dustless Blenders thoroughly mixes two or more substances into an inseparable whole . . . every part of which is the same analysis. Single receiving and discharging opening insures tight sealing during mixing process. "Open-door" accessibility permits thorough cleaning. The fast, accurate mixing operation increases output . . . cuts mixing costs. Available in many sizes with mixing capacities from ¼ ton to 75 tons per hour. Write for information and catalog.

Receiving — The ingredients to be mixed enter the mixing chamber of drums through a chute. Note scoops which carry up and dump the ingredients as drum rotates assuring a more uniform mix.

Discharging — Throwing a lever closes the inlet and mixer is in discharging position. The completely mixed materials drop off the lifting scoops and discharge through chute without segregation of ingredients.

The Sturtevant Mill Company

107-A Clayton Street, Boston 22, Massachusetts

Designers and Manufacturers of: CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

Products that require close inspection merit

JO-BLOCK PROTECTION

A section of the special, air-conditioned, temperature-controlled department at Brown & Sharpe, where all finishing operations of Johansson Gage Blocks are performed.

To assure excellent manufacturing conditions, the department is divided into three sections; one for finish grinding, one for rough lapping and one for finished lapping and final inspection.

If your products must meet close standards of accuracy, they'll warrant the use of measuring equipment periodically checked against Brown & Sharpe Jo-Blocks. With this protection, finished work meets specified tolerances *consistently*. Errors caused by poorly set measuring tools or worn gages will be caught before they can do serious harm.

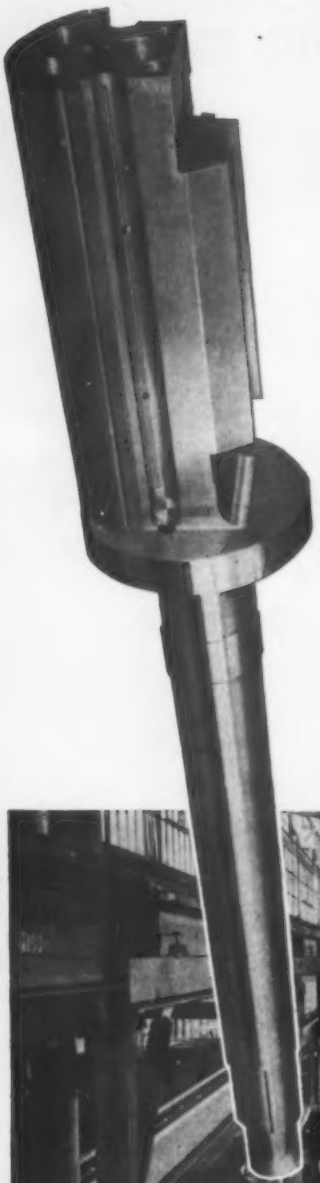
The ever-growing use of Jo-Blocks demonstrates their industry-wide importance . . . as master laboratory standards for setting and verifying work standards; as actual working gages; and as positive guides for laying out and setting up work with great accuracy.

Brown & Sharpe Jo-Blocks are made in 3 guaranteed accuracy standards; .000002", .000004" and .000008" . . . sold as single blocks or in sets. Write for new illustrated booklet on Jo-Blocks and Accessories. Brown & Sharpe Mfg. Co., Providence 1, R. I., U.S.A.

Johansson
BROWN & SHARPE

We urge buying through the Distributor

BROWN & SHARPE



Here, the best tools and skilled operators produce

OUTSTANDING FORGINGS

The Block Body for a Tension Reel shown here is an outstanding forging, symbolizing the end result of close teamwork at National Forge. Each individual skill is coordinated in the production procedure—from creating our own basic electric steel to the exact analysis you specify—through forging, rough machining, heat treating and finish machining.

The complex shape and close tolerances demanded in the finishing of such a forging require the most modern machine tools, and great skill and experience on the part of the operators.

Add continuous laboratory control of all operations and one responsibility, and you can see why so many forging buyers place complete confidence in National Forge. They know we will turn out their work 100% to their specifications in a minimum of time and at a reasonable cost.

May we present you with facts on the advantages of having all your forging operations under one responsibility? There is no obligation involved; just write to the NATIONAL FORGE AND ORDNANCE COMPANY, Irvine, Warren County, Pennsylvania.

NATIONAL FORGE AND ORDNANCE COMPANY

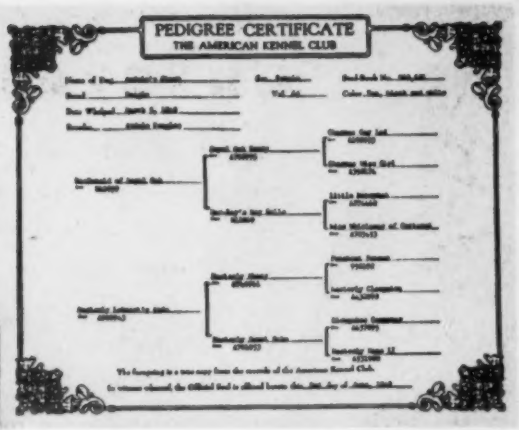
IRVINE, WARREN COUNTY, PA.

Steel Makers Forgesmiths Heat Treaters Machinists

☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆

Want Additional Product Information? See Page 19.

THE BEAGLE is always ready for the hunt. He is accustomed to hunting in a pack and when in action waves his tail gaily and obeys all commands quickly and cheerfully. Beagles should stand no higher than 15 inches.



In Boxes, too

The Pedigree is Assurance of Thoroughbred Stock

A "PEDIGREED BOX" results from integrated production, with quality control by one management from timber to finished box.

That's why American Sugar Refining Company uses Union boxes to provide safe packaging for Domino sugar from refinery to dealers' shelves.

75 years of undisputed leadership in paper packaging goes into Union boxes. Tremendous forest resources feed five of the largest paper machines in the world, in a completely integrated pulp-to-container plant unmatched in America for size and production. And four modern box plants, strategically located, serve you promptly and dependably.

Add all these *extra* assurances of consistent quality, dependable service and fair price and it's easy to see why every month more makers of national brand products are shipping in Union boxes.

UNION BAG & PAPER CORPORATION
CERTIFICATE OF BOX MAKER
THIS BOX CONFORMS TO ALL CONSTRUCTION REQUIREMENTS OF CONSOLIDATED FREIGHT CLASSIFICATION.
BURSTING TEST 200 LBS. PER SQ. INCH
SIZE LIMIT 75 INCHES
GROSS WT. LT. 65 LBS.
GA.
Domino Cane Sugar Old Fashioned Brown
24 Lbs. Net Weight
Domino Cane Sugar
Old Fashioned Brown
American Sugar Refining Company

TRADE MARK UNION

Dependable Packaging Since 1872

UNION Corrugated Containers

UNION BAG & Paper Corporation

Principal Offices: WOOLWORTH BLDG., NEW YORK 7, N. Y.

***Corrugated Container Plants:* SAVANNAH, GEORGIA • CHICAGO, ILLINOIS • TRENTON, NEW JERSEY**

NO, SIR!
The Seal Won't Blow!

METALLIC-BACKED neoprene seals are used in this famous bearing—and they are engineered to *stay put.* They can't blow.

Your lubricant stays in; dust and dirt stay out; the result is years and years of trouble-free performance.

The "SC" Bearing is a new member of the Dodge 30,000 hour line. Modern styling. Rugged one-piece cast iron housing. Long inner race. Radial and thrust load capacity. Fully self aligning. *WRITE* for special "SC" bulletin, giving complete specifications.

DODGE MANUFACTURING CORPORATION, 1300 Union St., Mishawaka, Ind.

DODGE TYPE "SC" BALL BEARING PILLOW BLOCK

Precision built bearing for small shafts and moderate loads. Pillow blocks, flange bearings and hanger bearings available from distributors' stocks in shaft sizes ranging from 3/4" to 2-7/16".

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained, he can give you valuable assistance on new, cost saving methods. Look for his name under "Power Transmission Equipment" in your classified telephone book.

DODGE
of Mishawaka, Ind.

FIRST IN POWER TRANSMISSION MACHINERY

NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

Here's why you'll like

ORTAC

. . . the answer to a universal hose problem

Now hose buying is simpler—thanks to Goodyear's development of **Ortac** (Oil Resistant Tube and Cover) Hose. Until the G.T.M.—Goodyear Technical Man—developed **Ortac,** using the same hose to handle acids, air, water, oil, gasoline and distillates often meant premature and costly failure.

But **Ortac** *handles all these materials where the service conditions are not too severe!* **Ortac** is highly resistant to petroleum products—mild concentrations of commercial acids—the contaminants found in water. Because it has a smooth bore, **Ortac** permits fast flow even when partially reeled. And it is sinewed with high-tensile rayon cords that make it extra-strong and highly flexible.

Consult the G.T.M.—let him tell you whether **Ortac** is *your* answer to hose problems, or whether you need one of Goodyear's many special-type hoses for specific jobs. Write him c/o Goodyear, Akron 16, Ohio.

GOODYEAR INDUSTRIAL RUBBER PRODUCTS

GTM-Specified ORTAC Hose for UNIVERSAL USE

A Tough cover withstands weather, oil, sun, abrasion

B Braid of high-strength rayon cord

C Tube resists gasoline, oil, weak acids

Facts about ORTAC

Sizes 3/16" through 1¼", with one, two or three braids depending on size. Built with static-dissipating wire, if desired. Available in continuous lengths or in shorter sections—from your Goodyear Distributor. Handles air, water, oil, gasoline and weak solutions of commercial acids.

FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

Ortac—T.M. The Goodyear Tire & Rubber Company

GOODYEAR

THE GREATEST NAME IN RUBBER

Want Additional Product Information? See Page 19.

FOR LEAKPROOF, TROUBLE-FREE PIPE RUNS

Cut-a-way view of a Walseal Tee showing ring of silver brazed alloy, and completed Silbraz joint.

Specify Walseal* Products

On all types of piping jobs where Type "B" copper or red brass pipe is used, trouble can be avoided by installing Silbraz* joints — made with Walseal valves, fittings and flanges.

Threadless, patented Silbraz joints are silver brazed (not soft soldered) pipe joints that are leakproof, trouble-free — permanent ... connections that will not creep or pull apart; that literally join with the piping system to form a "one-piece pipe line". Thus, these modern joints eliminate the need for maintenance and costly repairs — especially important where lowered operating costs are imperative.

For complete details on the modern Silbraz joint, made with Walseal products, write for a copy of Walworth Circular 84.

*Patented — Reg. U. S. Patent Office.

Recommended for

- Hot and Cold Water Circulating Systems
- Boiler Feed Lines
- Steam Return Lines
- Condensate Lines
- Low and High Pressure Air Systems
- Lubricating Oil Circulating Systems
- Industrial Gas Piping
- Solvent and Vacuum Piping Systems

Make it a "one-piece pipe line" with WALSEAL

WALWORTH

valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

WORLD'S FIRST MERCURY UNIT POWER PLANT*

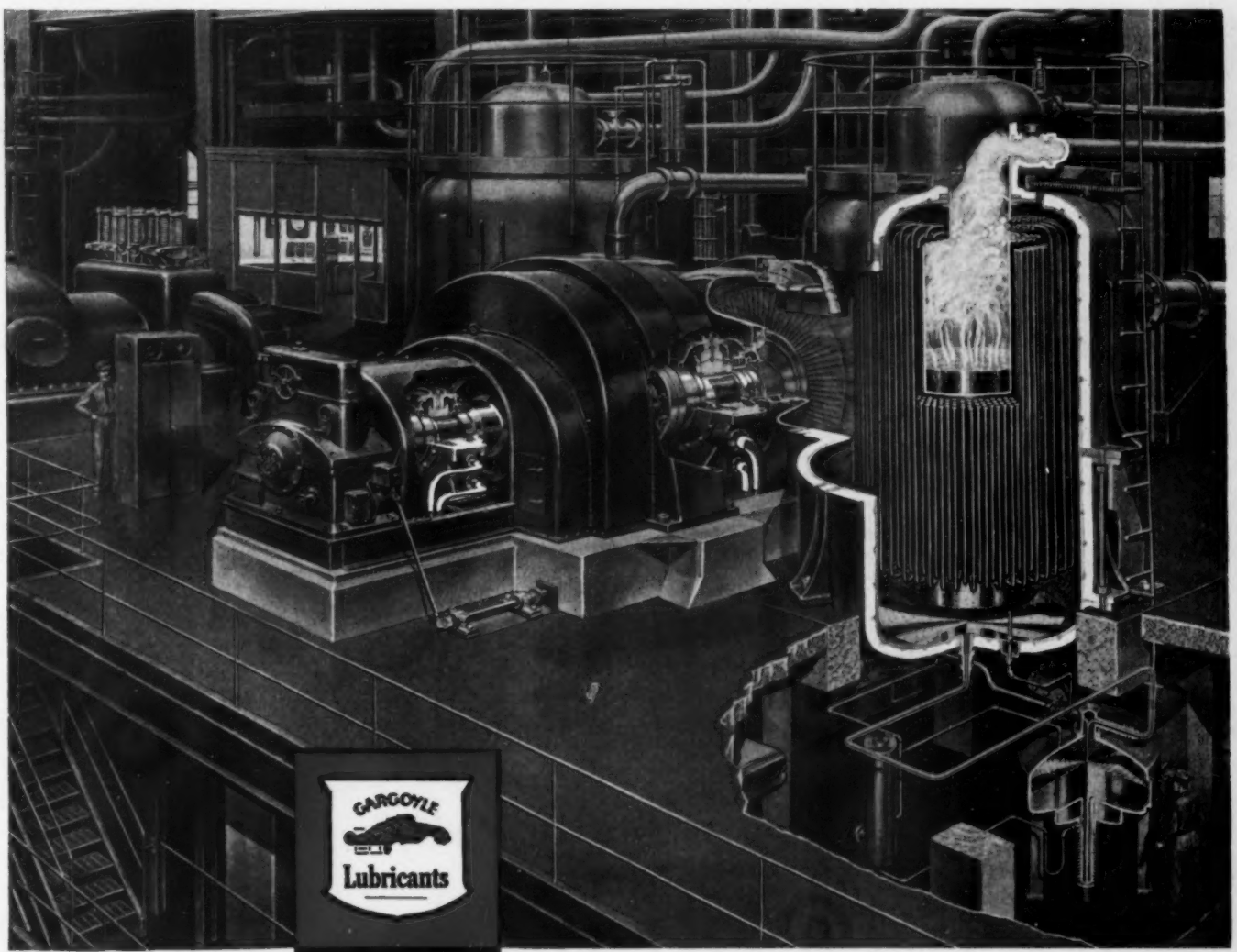
...gets the World's Greatest Lubrication Knowledge and Engineering Service

THIS unique mercury-steam turbine combination was built by General Electric for the Public Service Company of New Hampshire.

The new plant—now in operation in Portsmouth—teams two 7,500-kw mercury turbines (one cut open, center) with a single 25,000-kw steam turbine (left). Mercury vapor, which runs the smaller turbines, generates steam when it is condensed for re-use. This steam, in turn, is superheated and used to power the larger turbine. There are no fuel-fired steam boilers.

This first mercury unit power plant—like so many other "firsts" in industry—is lubricated 100% by Socony-Vacuum. Famous Gargoyle D.T.E. Oil 797 helps protect costly bearings and other parts. Other Gargoyle Oils help keep auxiliary equipment on the job.

Why not get the world's greatest lubrication knowledge for *your* plant, too?



GARGOYLE Lubricants

*The first mercury-steam power plant designed and co-ordinated as a unit station.

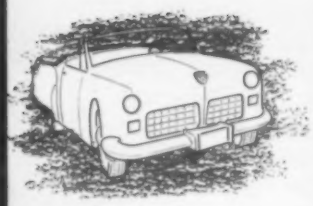
SOCONY-VACUUM OIL CO., INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY GENERAL PETROLEUM CORP.

SOCONY-VACUUM

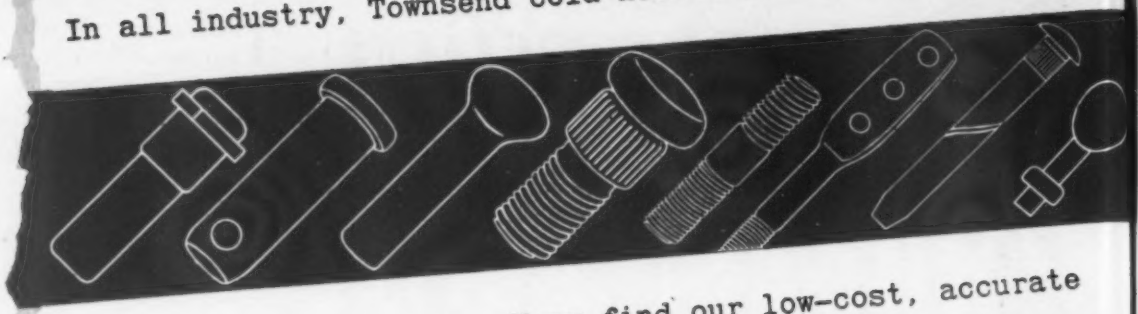
SOCONY-VACUUM

Correct Lubrication

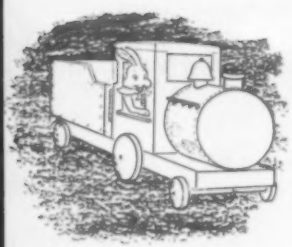
Want Additional Product Information? See Page 19.

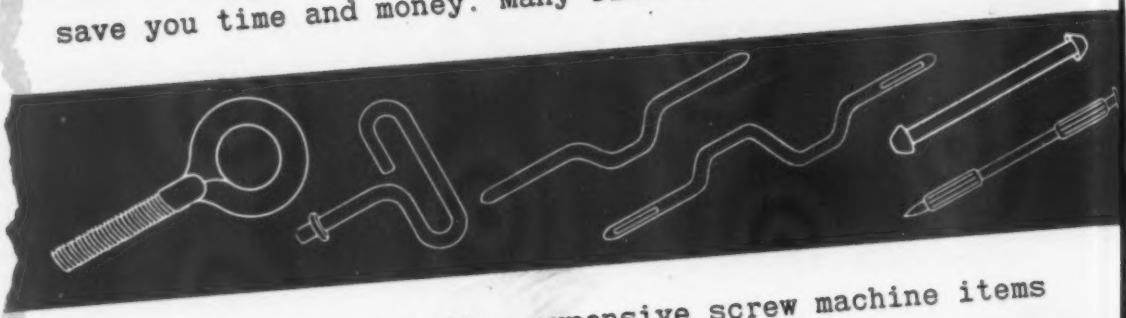


In all industry, Townsend cold-headed parts and fasteners

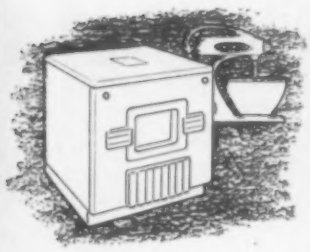


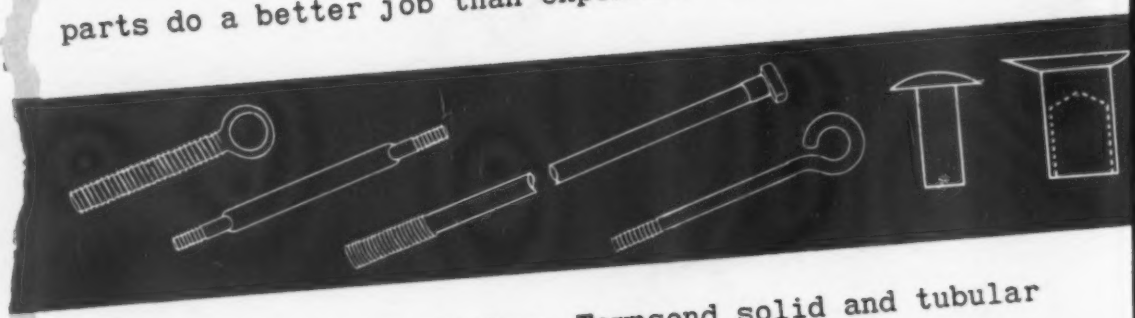
save you time and money. Many find our low-cost, accurate



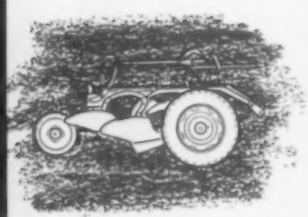


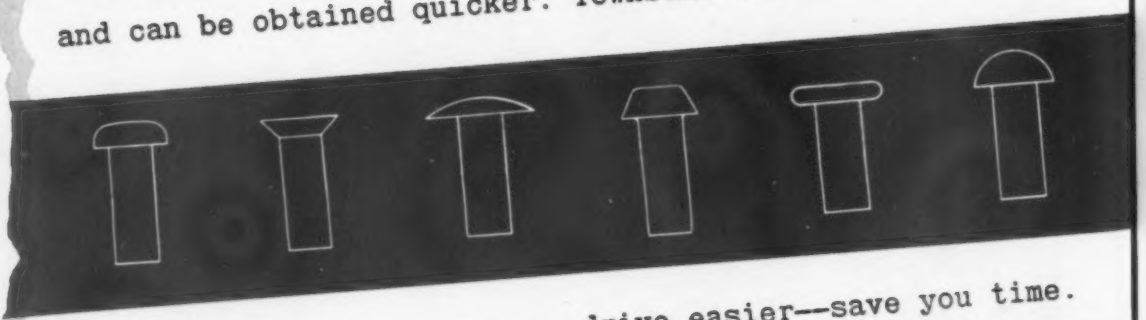
parts do a better job than expensive screw machine items



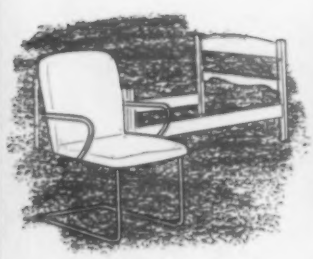


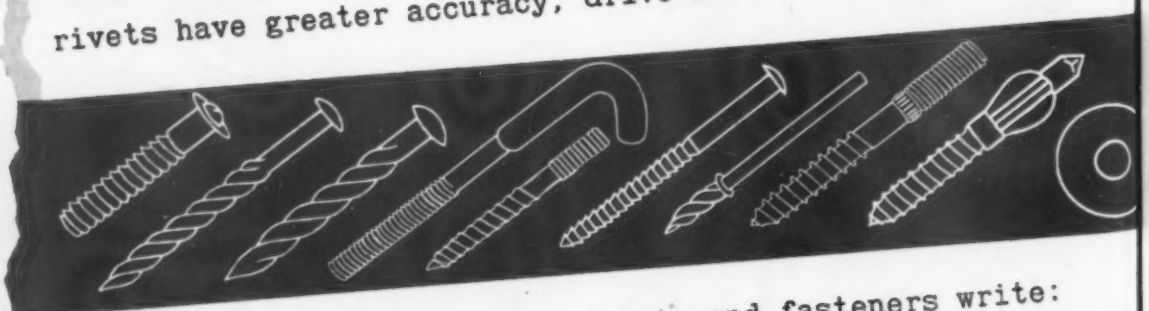
and can be obtained quicker. Townsend solid and tubular



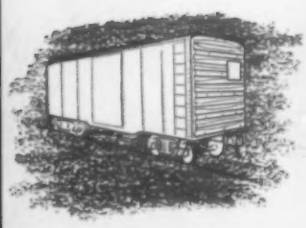


rivets have greater accuracy, drive easier—save you time.





For help in reducing costs on parts and fasteners write:



Townsend

COMPANY — ESTABLISHED 1816

New Brighton, Pa.

Chicago 38, Ill.

Greist Mfg. Co. improves lighting, speeds production ...with G-E slimline lamps

1 In the new addition to the Greist Manufacturing Company of New Haven, General Electric slimline fluorescent lamps are used throughout. More than 80 footcandles of light, plus light-colored surroundings, make seeing easier—boost worker accuracy and production.

The continuous rows of G-E slimline lamps are easy to maintain; rugged push-pull sockets permit one man to quickly replace a 16-foot row of lamps without moving his ladder. And slimlines start instantly, need no starters, have long life and high efficiency.

2 4-lamp fixtures do the job throughout the plant, as in this parts tumbling room. Decision to use slimline was based on long life, low-cost maintenance, and availability of three brightness levels.

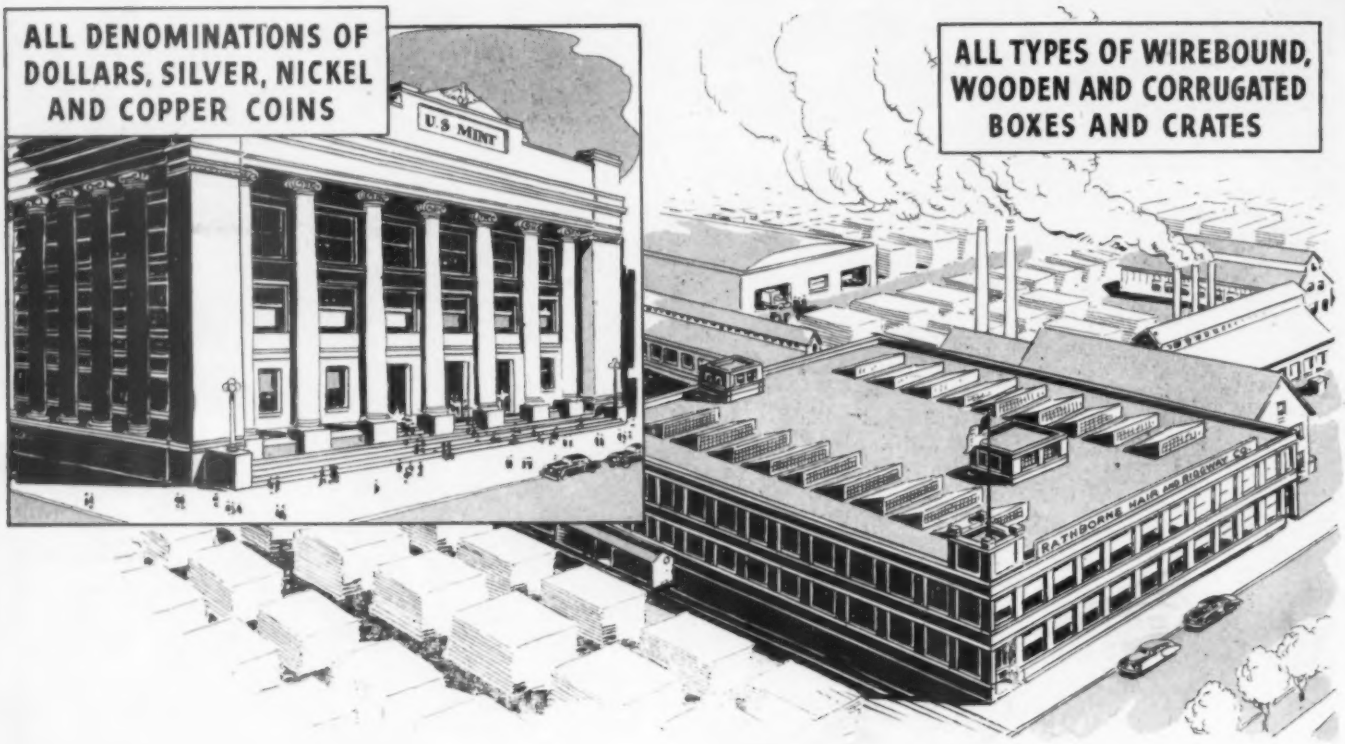
G-E slimline fluorescent lamps:
• High efficiency
• Low maintenance cost
• Instant start, no starter needed
• Three brightness levels
• Single-pin base, easy in and out

3 All the advantages listed above are yours when you use General Electric slimline fluorescent. Ask your G-E Lamp supplier—he will be glad to advise you what type of slimline best meets your needs.

4 **FREE BOOKLET.** For more information on what slimlines can do for your factory and offices, write for your free copy of "Modernize with G-E Slimline." General Electric, Nela Park, Cleveland 12, Ohio.

GENERAL ELECTRIC

Want Additional Product Information? See Page 19.


ALL DENOMINATIONS OF DOLLARS, SILVER, NICKEL AND COPPER COINS
U.S MINT
ALL TYPES OF WIREBOUND, WOODEN AND CORRUGATED BOXES AND CRATES
RATHBORNE HAIR AND RIDGWAY CO.

One Reliable Source for Everything

SHIPPING SUPERSTRONG CONTAINERS
REG U.S. PAT. OFF.

WIREBOUND BOXES and CRATES

WOODEN BOXES and CRATES

CORRUGATED FIBRE BOXES

BEVERAGE CASES

STARCH TRAYS

PALLETS

The shipping requirements of your various products may call for a number of types of wirebound, wooden or corrugated shipping containers.

SUPERSTRONG can supply all of your needs with a complete line of boxes and crates, backed by the assurance of nearly a century of experience and reliability. A SUPERSTRONG container is designed and built to the special requirements of the product which it must protect.

SUPERSTRONGS incorporate features of increased efficiency and economy. Just let us know when we may call and tell you the full story.

RATHBORNE, HAIR AND RIDGWAY COMPANY
1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS

The complete N-B-M BABBITT line . . . with each babbitt alloyed for specific service . . . gives you lower cost bearing life.

So-called "all-purpose" babbitts may be costing you money. A recent survey of a plant made by one of our engineers proved that a *saving of one-third on babbitt costs* could be made by using two grades of babbitt. Instead of using a high-tin babbitt exclusively in this plant, it was found that a very large percentage of the applications required only a low-cost lead-base babbitt.

Whatever your problem in babbitt metal may be, you'll find your answer in the complete line of National Bearing Division. Service recommendations are based on years of successful applications and experiences in solving babbitt problems. Write today for the facts on this complete line of Babbitt Metal.

This free book shows you how to get longer bearing service . . .

Contains valuable and complete data: how to specify, melt and pour Babbitt . . . how to prepare shells for stronger bonds. Use the handy coupon to order your free copy today.

Please send me your data book on Babbitt Metals:

Name_____

Title_____

Company_____

Address_____

City_____ State_____

N B M

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4940 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

Want Additional Product Information? See Page 19.

The ABC's of Powell Valve PERFORMANCE

Fig. 559—125-pound Iron Body Bronze Mounted Swing Check Valve. Flanged ends, bolted flanged cap and regrindable, renewable bronze seat and disc. Disc, when wide open, permits full, unobstructed flow through valve body.

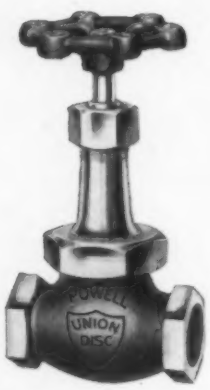


Fig. 150—150-pound Bronze Globe Valve with screwed ends, union bonnet and renewable composition disc.

Always the right valve. And, because Powell *can* always furnish the *right* valve, you can avoid failures that result from trying to make a valve "do" in a service to which it is not *specifically* adapted, as well as those caused by misapplication.

Built to last. Powell Valves are designed for long life at a minimum cost of maintenance. The cost of construction and materials of any Powell Valve is determined solely by the requirements of the service for which the valve is designed.

Complete Line. Powell Valves are made in all types such as Globe, Angle, "Y", Gate, Check, Non-return and Flush Bottom Tank. Materials include not only Bronze, Iron and Steel but also a wide range of Corrosion-Resistant metals and alloys.

Ask your nearest Distributor—or write direct

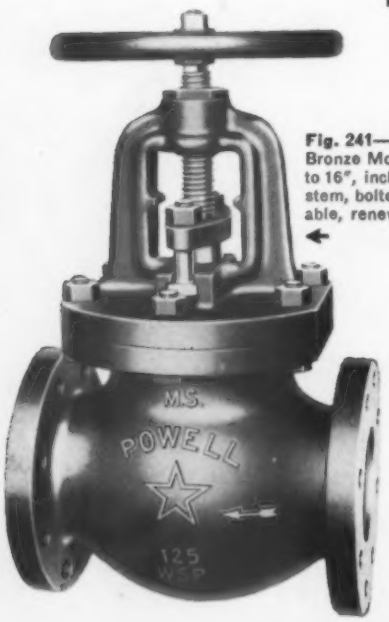


Fig. 241—Large 125-pound Iron Body Bronze Mounted Globe Valve. Sizes 2" to 16", incl. Has outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc.

Fig. 500 — 125-pound Bronze Gate Valve with screwed ends, screwed-in bonnet, inside screw rising stem and tapered wedge; solid in sizes ¼" to ¾"; double in sizes 1" to 3".

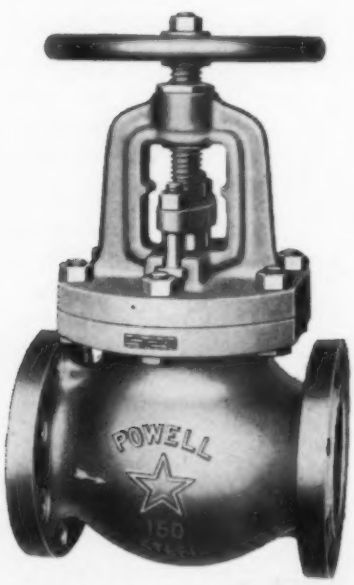


Fig. 1531—Class 150-pound Cast Steel Globe Valve with flanged ends, bolted flanged yoke, outside screw rising stem.

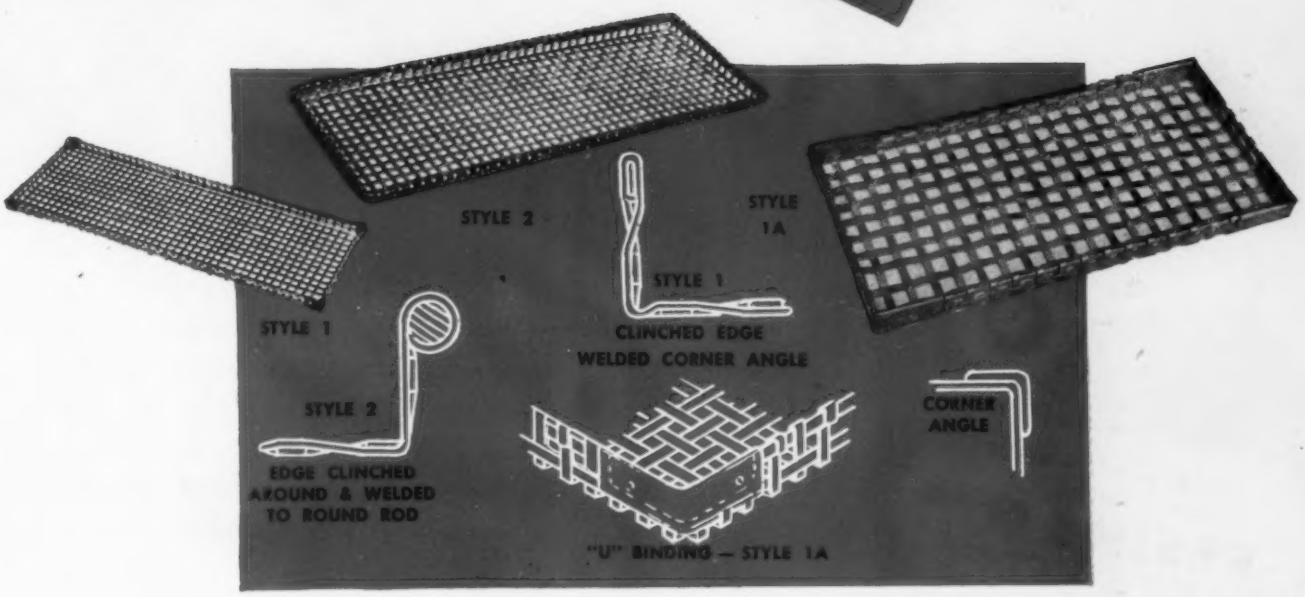
The Wm. Powell Company
Cincinnati 22, Ohio
DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

ROLOCK

FABRICATED ALLOYS

HEAT AND CORROSION RESISTANT



CUT COSTS WITH TESTED BRAZING TRAYS

If you have experienced bad scaling, broken wires, cracked corners, wire growth or too-early disintegration of brazing trays, we believe the following tests will be of great interest. A large manufacturer, in cooperation with Rolock engineers, made a detailed study of copper brazing tray design and materials. Six styles of baskets (4 different materials, 2 different mesh specifications) were exposed to electrically heated furnace temperature of 2050° F.

Result: Rolock ¼" x 1/16" flat wire Inconel trays, with riveted "U" binding corner construction, have been standardized by the manufacturer. They gave *3 times the service life* of the *other specifications.*

We show above Rolock Brazing Trays... all with flat wire mesh. The "winner" is Style 1A. Style 1 is light in weight... no top bar, but strengthened with corner angle. Style 2 has *top ring for extra strength.*

Rolock will design and build your Brazing Trays for your specific needs... give you longer service life, at lower costs... and a better job. Details and Catalog on request.

Offices in: PHILADELPHIA • CLEVELAND • DETROIT • HOUSTON • INDIANAPOLIS • CHICAGO • ST. LOUIS • LOS ANGELES • MINNEAPOLIS

ROLOCK INC. • 1272 KINGS HIGHWAY, FAIRFIELD, CONN.

JOB-ENGINEERED for better work
Easier Operation, Lower Cost

Want Additional Product Information? See Page 19.

These concave harrow discs are ground and polished in one lightning-fast, dollar-saving operation with RESINALL METALITE Cloth Belts and backstand idlers. Typical of the versatility of this profitable combination is the way these discs are given a spun finish by the action of the abrasive belt, which cuts and at the same time revolves the disc on its ball bearing fixture. Removing the scale and polishing takes only 18 to 35 seconds of actual sanding time!

RESINALL METALITE Cloth Belts finish these and many other pieces faster and with less cost because they're resin-bonded to withstand hot, heavy-duty work. The special bond won't get soft and tacky and the belt definitely resists loading and glazing. RESINALL METALITE Cloth Belts cut sharp and fast all the way.

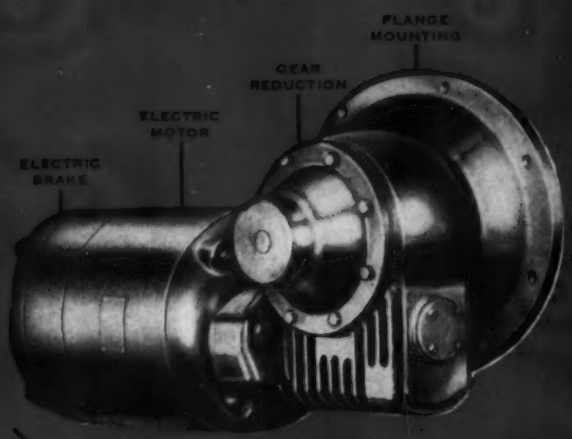
Behr-Manning abrasive belts are slashing finishing costs everywhere. Whatever the material or shape of your products, it will pay you to check with our field engineer in your area. A new bulletin, just off the press, tells the whole story. Write for it today.

BEHR-MANNING®

BEHR-MANNING
TROY, N.Y.

Use NORTON® abrasives Sharpening Stones

Want Additional Product Information? See Page 19.



The power drives on this machine incorporate an electric motor, a gear reduction, an electric brake and a flange mounting . . . all standard Master units that easily combine into one compact, integral power-package that's just right for this machine. This permits many parts to be stripped away from both the power unit and the completed machine . . . makes a job that's all muscle, no fat.

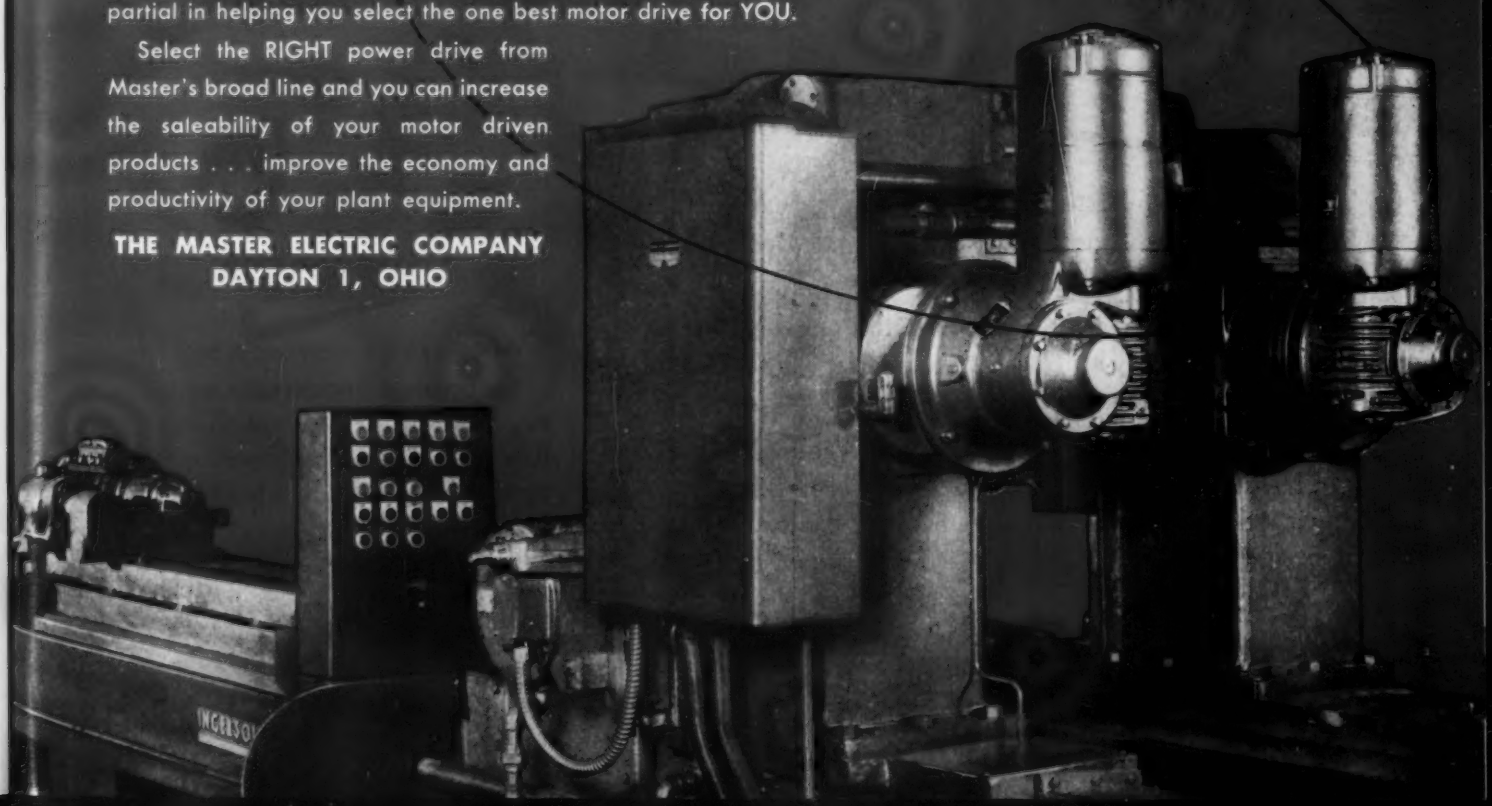
Master Motors, available in thousands and thousands of types and ratings (up to 150 HP) give you an enormous selection of integrally built power drives with which you too can easily secure these same results.

all muscle . . . no fat

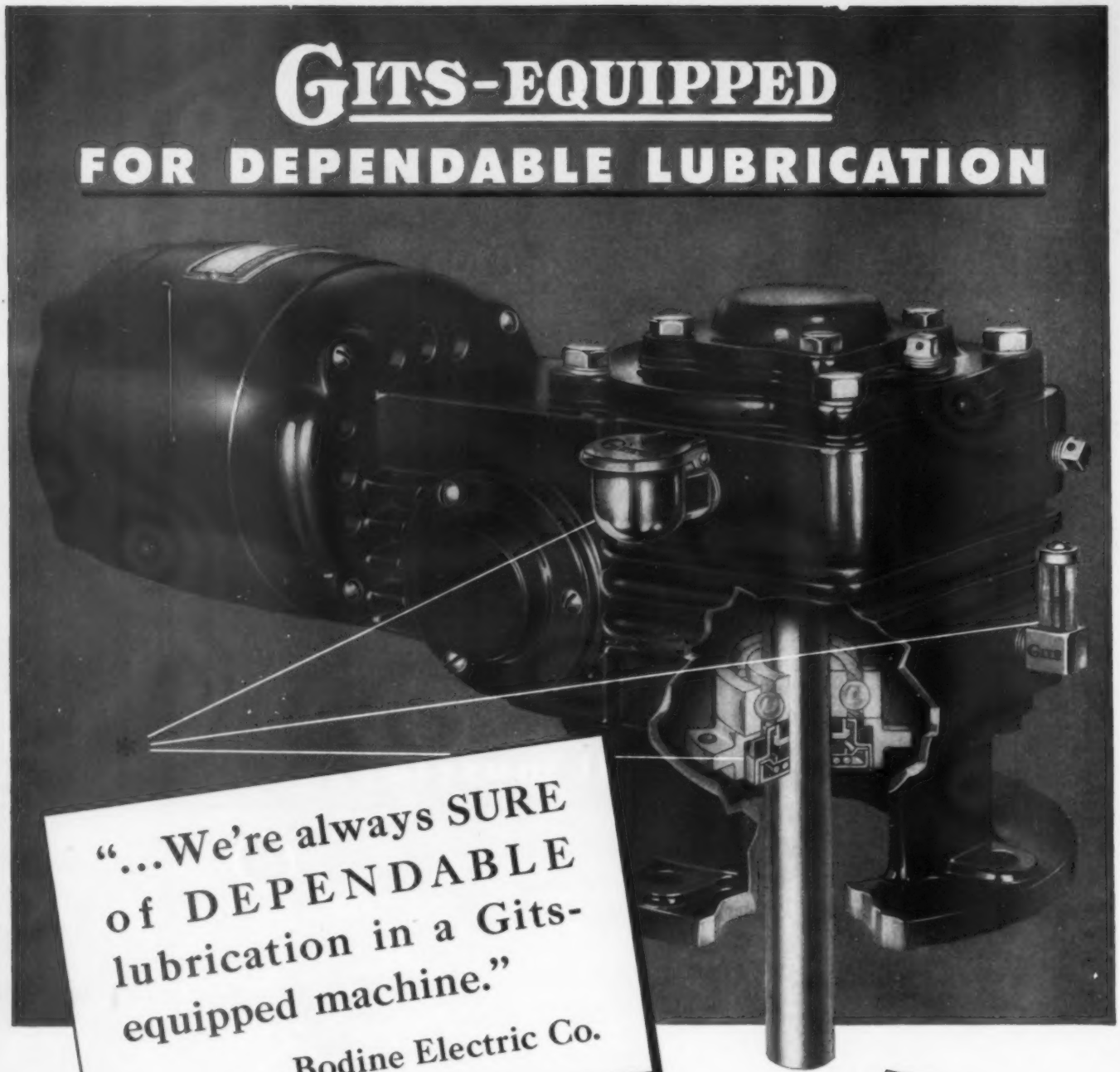
Open, enclosed, splash proof, fan-cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 432 to 1 ratio . . . with electric brakes . . . with mechanical variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best motor drive for YOU.

Select the RIGHT power drive from Master's broad line and you can increase the saleability of your motor driven products . . . improve the economy and productivity of your plant equipment.

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO



GITS-EQUIPPED
FOR DEPENDABLE LUBRICATION



"...We're always SURE of DEPENDABLE lubrication in a Gits-equipped machine."

...Bodine Electric Co.

That's why Bodine Electric Company engineers chose Gits lubricating devices and shaft seals for the Bodine "Group 4" worm gear reducer (shown here).

*Note the Gits Oil Cup, the Gits Oil Gauge, and the Gits Unit Seal (the only seal Bodine has found that "positively seals a vertical head of tough gear case oil").

Make Gits' 40 years of engineering know-how *your* partner in production, *your* assurance of absolutely dependable lubrication wherever there are moving parts.

Write Today...

.. for prompt quotations, and recommendations on your lubricating and shaft sealing problems....Detailed booklet free on request.

*GITS OILS IT • SEALS IT • GAUGES IT!

GITS BROS. MFG. CO. 1865 S. Kilbourn Ave. • Chicago 23, Illinois

Want Additional Product Information? See Page 19.

WICKWIRE ROPE

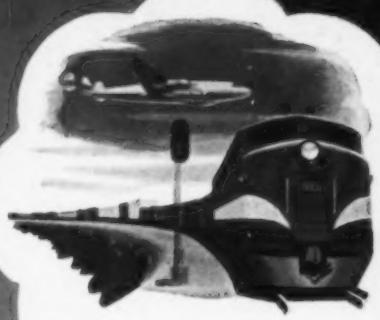
A PRODUCT OF CF&I

Ask any user . . . you'll find them everywhere

In scores of industries, users of Wickwire Rope have developed an affectionate respect for its performance, safety and long life. And, for true economy, they use Wickwire's WISSCOLAY® Preformed. It lasts longer — is easier to cut, splice and install. It's kink-resistant and safer to handle. Wickwire Distributors and Rope Engineers, in key cities everywhere, are prepared to render prompt service in meeting your wire rope needs. Wickwire Rope Sales Office and Plant — Palmer, Mass.

IN THE EAST — Wickwire Spencer Steel Div. of C. F. & I.
500 Fifth Ave., New York 18, N. Y.
IN THE ROCKIES — The Colorado Fuel and Iron Corp.
Continental Oil Bldg., Denver, Colo.
ON THE WEST COAST — The California Wire Cloth Corp.
1080 — 19th Ave., Oakland 6, Cal.

LOGGING

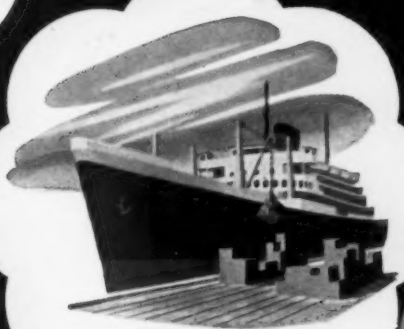


TRANSPORTATION

MINING

PETROLEUM

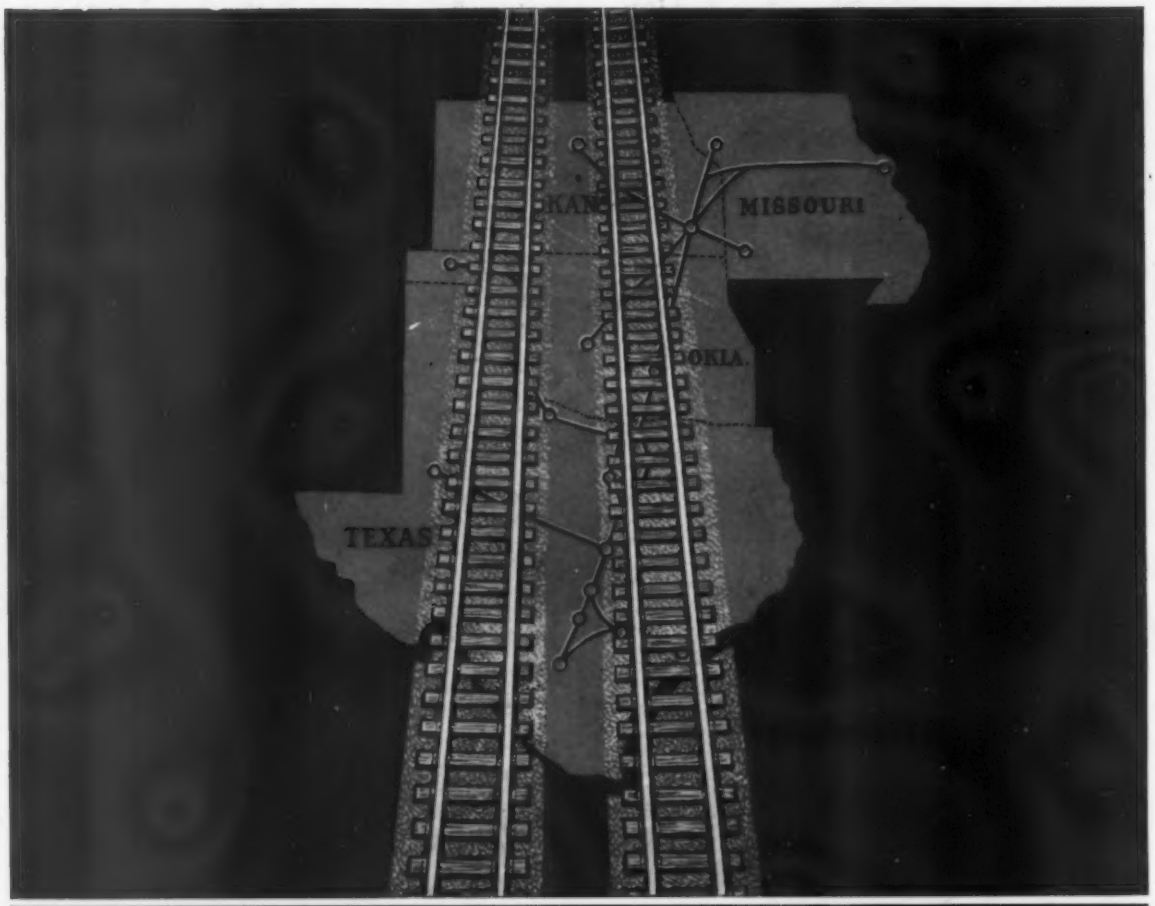
MANUFACTURING



MARINE

CONSTRUCTION

A. E. Brotman



You're on the right track when you ship *Katy*

Five crack Katy freights, operating on stepped-up daily schedules, provide dependable, on-time service between Texas and Oklahoma and the North, with extensive connecting service at terminals.

Smooth-hauling new road and yard Diesels, new cars and new rail . . . new automatic signals . . . the swift magic of radio, on-line and at terminals . . . service PLUS to you. Broader facilities, in rolling stock, yards and terminals, with one idea in mind: SAFER, BETTER FREIGHT SERVICE for You!

End-to-End Radio Communication means safer, speedier handling of freight, in all kinds of weather.

Automatic Block Signals precision-control the movements of Katy's freight fleet to suit your every shipping need.

Modern Freight Terminals combine human skill and mechanical facilities to process your freight with maximum safety and efficiency.

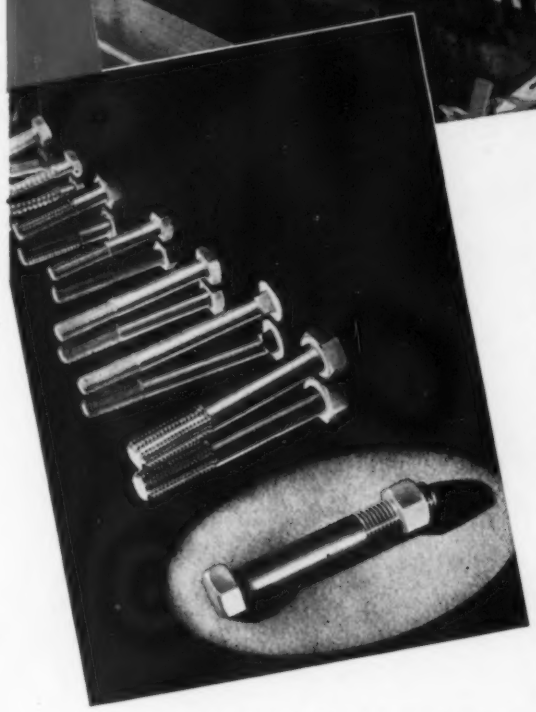
the Katy

M·K·T
KATY RAILROAD
MISSOURI-KANSAS-TEXAS

NATURAL ROUTE SOUTHWEST

310

"All Our Plants Use *Udylite* Equipment"



Products of Russell, Burdsall & Ward Bolt & Nut Co. cadmium-plated by Udylite Barrel equipment at their Port Chester, N. Y., plant. This firm also has plants in Pennsylvania, Illinois and California, all using Udylite equipment.

Says Russell, Burdsall & Ward Bolt & Nut Co.

"It Gives Our Products Greater Customer Acceptance!"

EVERY DAY alert manufacturers like Russell, Burdsall & Ward Bolt & Nut Co. are turning to Udylite plating equipment for fine finishes and dependable operation.

They've found both Udylite automatic and barrel equipment give their products better, more uniform metal finishes at lower cost.

Udylite automatic equipment reduces direct labor costs, holds maintenance to a minimum and requires less floor space per unit.

Udylite barrel equipment for cyanide and acid baths, is noted for rugged construction and low-cost operation.

Add up these advantages and you'll see why Udylite plating equipment is your best investment.

In addition, Udylite offers *complete* plating service—before and after installation. If you are planning a new installation or if you face a plating problem with your present equipment—it will pay you well to call in your Udylite Technical Man. He'll be glad to help you at any time—without any obligation. Call him today or write to us direct.

PIONEER OF A BETTER WAY IN PLATING

THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN

Want Additional Product Information? See Page 19.

Gruelling tests... *an essential part of every* LUNKENHEIMER VALVE!

RIGID TESTING, far above the usual practice, is regular procedure in the production of Lunkenheimer Valves. From selection of raw materials to final assembly, nothing is left to chance or guess. Each and every operation is gauged to meet the high quality standards which assure dependable performance, longer service life and minimum upkeep.

In gate valves, for example, a Lunkenheimer final test means that *every* valve is tested on both sides, at high and low pressure for seat tightness and then given a careful shell test. Spot testing is not tolerated.

This may be producing valves the "hard way", but for Lunkenheimer, it's the only way since it safeguards our proudest possession . . . the mark of unswerving quality and dependability.

ESTABLISHED 1862

THE LUNKENHEIMER CO.

—"QUALITY"—

CINCINNATI 14, OHIO, U.S.A.

NEW YORK 13 · CHICAGO 6 · BOSTON 10 · PHILADELPHIA 34

EXPORT DEPT. CINCINNATI 14, OHIO, U.S.A.

Fig. 2150

150 lb. S.P. Bronze Gate

Like three valves in one. Number 2150 Double Disc, or Number 2151 Solid Wedge Disc, Rising Stem; or Number 2153 Single Wedge Disc, Non-rising Stem. How to convert one type to another by a simple interchange of trimmings is fully explained in Circular Number 574 available from your Lunkenheimer Distributor or direct.

Continually improved testing equipment, together with superior metallurgy and the most modern production equipment assures longer and trouble-free operation, making Lunkenheimer Valves cost less per year of service.

Another assurance of better valve service

In the event of valve trouble, you need and can depend upon, quick service from your Lunkenheimer Distributor. His stocks and facilities shorten production tie-ups, save you dollars and hours. Whether it's an emergency, routine maintenance or new installations, phone your Lunkenheimer Distributor for fast, dependable service.

Leadership through Achievement!

Creative Package Engineering

this corrugated "spectacular" box

Attracts attention . . . advertises . . . identifies the manufacturer . . . dramatizes the product—sells. Engineered to protect its contents, the box saves packaging time and labor, cuts packaging costs, simplifies handling difficulties. Your product is worthy of these advantages. For more aggressive package action, consult Hinde & Dauch, Executive Offices, 5002 Decatur St., Sandusky, Ohio.

H&D®

HINDE & DAUCH

Authority on Packaging

Fact-packed booklet of packaging information "How To Pack It"—32 pages of valuable data . . . 80 vivid photos . . . hundreds of packaging ideas. Write for your copy.

FACTORIES AND SALES OFFICES IN: Baltimore • Buffalo • Chicago • Cleveland • Detroit • Gloucester, N. J. • Hoboken, N. J. • Kansas City, Kan. • Lenoir, N. C. • Richmond, Va. • Sandusky, Ohio St. Louis • Watertown, Mass. SALES OFFICES IN: Akron • Battle Creek • Cincinnati • Columbus • Denver • Erie, Pa. • Fairfield, Conn. • Findlay, Ohio • Greensboro, N. C. • Indianapolis • Miami Minneapolis • Olean, N. Y. • Omaha • Philadelphia • Pittsburgh • Reading, Pa. • Roanoke, Va. • Rochester • Toledo • Worcester, Mass. IN CANADA, HINDE & DAUCH PAPER CO. OF CANADA, LTD., Toronto • Montreal • Chatham • Calgary • Halifax • Hamilton • Kitchener • London • Peterborough • Quebec • Regina • St. John, N. B. • St. John's, Newfoundland • Vancouver • Winnipeg

AO DURALITE Acetate GOGGLE

When Safety and Eyecup Transparency are Important AO Suggests this

DURALITE ACETATE GOGGLE!

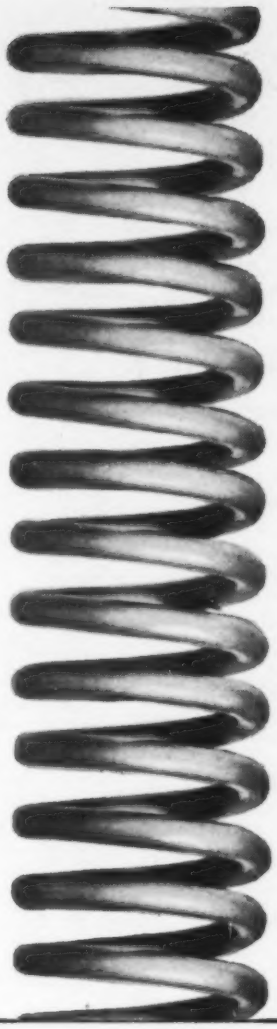
Workers like the lightweight comfort of this goggle (AO 324A) with its eyecups of *transparent acetate* individually molded to fit the contour of each eye . . . the low set of the cups for wide angle vision and the smooth, rounded edges. What's more, the eyecups won't conduct heat and they provide ample ventilation to combat fogging by means of air channels and *many* side perforations. Ask your nearest AO Safety Products Representative for this popular goggle.

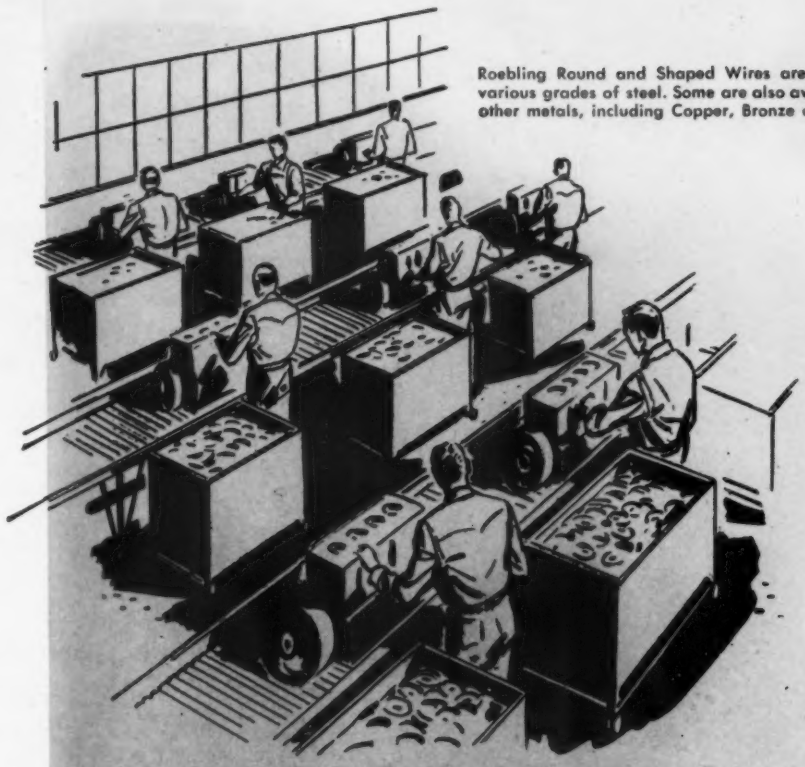
Quick Facts

- **LENS RETAINING RINGS** of aluminum, specially treated to resist corrosion.
- **BRIDGE** is insulated, ball-chain type, quickly adjustable.
- **LENSES** are 50 mm. Super Armorplate or 6 Curve Super Armorplate, clear or Calobar. Medium, dark or extra dark.
- **HEADBAND** is one-piece rubber, easily adjustable.
- **RUBBER CUSHIONS** may be had around edge of eyecups at slight extra cost.

American Optical COMPANY
SAFETY PRODUCTS DIVISION

Southbridge, Massachusetts • Branches in Principal Cities





Roebling Round and Shaped Wires are made in various grades of steel. Some are also available in other metals, including Copper, Bronze and Brass.

Every inch dependably uniform... that's why users say...

Today it's Roebling!

for Oil-Tempered Spring Wire

NO IFS, ANDS OR BUTS . . . production records show that Roebling Oil-Tempered Spring Wire cuts down machine stoppages and minimizes rejects for users everywhere. This is a *quality* wire. Every inch is alike in gauge and finish . . . absolutely uniform in mechanical and metallurgical properties.

Roebling has one of the largest mills in the country for the making of specialty wires. From steel-making to finished wire, every manufacturing step is performed in Roebling's own plants. Modern techniques and modern precision equipment assure a product that saves you preparation time . . . brings faster, smoother operation.

Your Roebling Field Man will gladly help you choose the best wire—round, flat or shaped—for greatest efficiency and economy. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING *A CENTURY OF CONFIDENCE*

Atlanta, 934 Avon Ave. ★ *Boston,* 51 Sleeper St. ★ *Chicago,* 5525 W. Roosevelt Road ★ *Cincinnati,* 3253 Fredonia Ave. ★ *Cleveland,* 701 St. Clair Ave., N. E. ★ *Denver,* 4801 Jackson St. ★ *Houston,* 6216 Navigation Blvd. *Los Angeles,* 216 S. Alameda St. ★ *New York,* 19 Rector St. ★ *Philadelphia,* 12 S. Twelfth St. ★ *Portland,* 1932 N. W. 14th Ave. ★ *San Francisco,* 1740 Seventeenth St. ★ *Seattle,* 900 First Ave. S.

Specify Thermoid Steam Hose

Powerflex Wire Braid Steam Hose

Unequalled for strength and flexibility, it offers more capacity, greater safety, longer wear. The tough, thick, heat-resisting inner tube is of specially compounded black rubber . . . high-tensile steel wire braids safeguard against bursting . . . asbestos braid dissipates heat and firmly bonds the cover to the hose body. Special cover is heat and abrasion resistant. Furnished in sizes from ½" to 2½", in lengths up to 50 feet. An all-purpose steam hose for all pressures up to 200 psi.

Hi-Temp Steam Hose

Mandrel-built—special heat-resisting rubber tube . . . braided asbestos-yarn reinforcement . . . heat and wear resistant cover. Furnished in sizes from ½" to 2" inside diameter in 25 or 50 foot lengths. A lighter weight all-purpose steam hose for superheated steam up to 200 psi.

#300 Steam Hose

Heat-resisting rubber tube. Cotton fabric reinforcement. Heat and wear resistant cover. Furnished in sizes ½" to 2½", in 25 and 50 foot lengths. For general service where steam pressure does not exceed 150 psi.

These latest developments in steam hose are typical of the results obtained through Thermoid's continuing research and study of product applications. Thermoid's planned program of product research and development assures you of maximum service and lowest operating costs whenever you specify Thermoid Industrial Rubber Products.

It will pay you to *Specify* Thermoid!

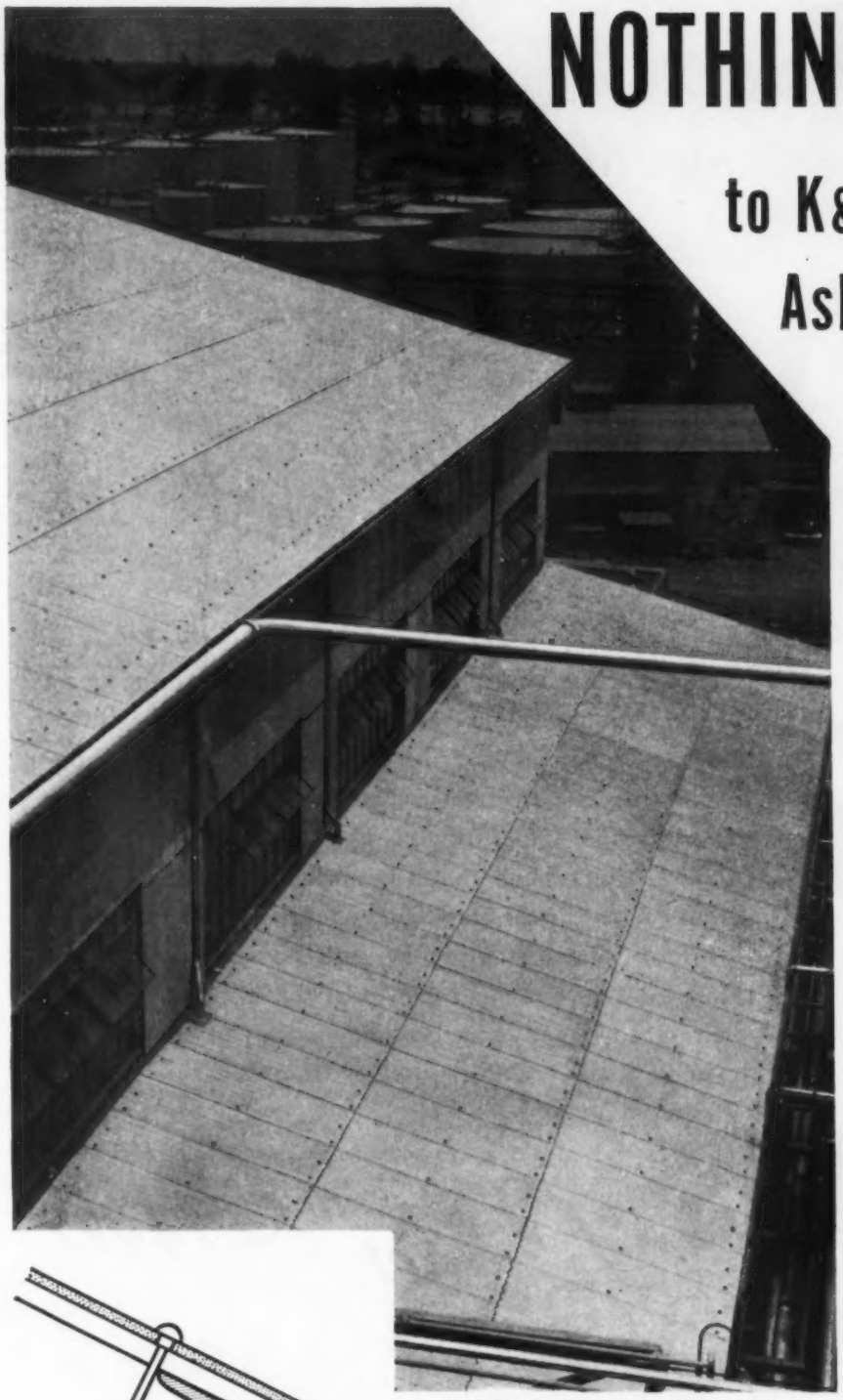
Thermoid Quality Products: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Molded Products • Industrial Brake Linings and Friction Materials.

Thermoid Company

Main Offices and Factory • Trenton, N. J., U. S. A.
Western Offices and Factory • Nephi, Utah, U.S.A.
Industrial Rubber Products • Friction Materials • Oil Field Products

NOTHING HAPPENS

to K&M *"Century"* Asbestos Corrugated



Here you see it used for both the roofing and siding on this Shell Oil Company building at Deer Park, Texas. Don't ever expect to see it hurt by the weather or other adverse atmospheric conditions. Count on it to go rustless and rotless. It won't suffer from rodents and termites, and is exceptionally resistant to fire.

Easily cut and fitted on the job, K&M "Century" Asbestos Corrugated produces tight, good-looking surfaces at minimum labor cost. For extra savings use "TOP-SIDE"* fasteners, as on this Shell building. They entirely eliminate scaffolding and are only available with K&M "Century" Asbestos Corrugated.

Your finished job will benefit by the inherent structural strength of this material which actually gains strength with age. As for upkeep, you needn't figure on even one bit of paint!

*® H. & B. Enterprise Corp.

ERECTORS: Lummus Co., New York City.

"TOP-SIDE" FASTENERS are made in various types, to fit all steel members on both roofing and siding. Illustration of typical "J" type for roofing.

Nature made Asbestos...
Keasbey & Mattison has made it serve mankind since 1873

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

"I'M NO METALLURGIST . . . BUT I'VE FOUND YOU CAN'T BEAT 'Silver Steel' SAWS!"

The House of Atkins has been proving and *improving* the quality of its products for 92 years. Atkins "Silver Steel" Saws are the result of this long, scientific development. They are crafted of the world's finest steel for sawing purposes.

You don't have to be a metallurgist to discover that Atkins "Silver Steel" Saws cut faster, easier, truer —that "Silver Steel" Saws ask no favors, fear no jobs!... When you find the words "Silver Steel" etched on a saw, you can be immediately assured that you've found the best saw for its purpose!

Only ATKINS makes "Silver Steel" SAWS

—of all fine saws—the finest are "Silver Steel" Saws

E. C. ATKINS AND COMPANY

Home Office and Factory:
402 S. Illinois Street, Indianapolis 9, Indiana
Branch Factory: Portland, Oregon
Machine Knife Factory: Lancaster, Pennsylvania
Branch Offices: Atlanta • Chicago • New Orleans • New York

MAKERS OF BETTER SAWS FOR EVERY CUTTING JOB

AAA TRADE MARK ATKINS "ATKINS ALWAYS AHEAD"

Want Additional Product Information? See Page 19.

B.F. Goodrich

announces

TW TIRE AND WHEEL ANALYSIS PLAN

for materials handling

HOW IT WORKS

An experienced tire and wheel man will survey your operation. He will study loads, hauls, handling equipment, floors and hauling surfaces, and discuss any special tire and wheel problems you may have. On completion of this survey the BFG man, without charge or obligation on your part, will submit recommendations as to the best type and size tires and wheels for your particular service with information on the longest-wearing compounds and on retreading. He will also provide suggestions on tire care and maintenance.

HOW YOU SAVE

Tire and wheel costs can be cut as much as 50% through the application of the right type, size and tread compound, to the job. Additional savings are made through protection of floors, equipment and cargo. (Previous studies show improvements can be made in two out of three operations.)

Proper tire maintenance alone can cut tire and wheel costs 10% to 20%.

WHY YOU GET IMPARTIAL RECOMMENDATIONS

No other company offers as wide a range of types, sizes, and tread compounds as B. F. Goodrich. There is no selfish reason for a B. F. Goodrich man to push any one type of tire against another. He has them *all.* His advice is impartial.

14 TYPES OF TIRES—6 DIFFERENT TREAD COMPOUNDS

B. F. Goodrich offers a complete line of tires for materials handling equipment—pneumatics, puncture-sealing inner tubes, solids including pressed-on and vulcanized-on types, zero pressure types (semi-pneumatics). There's a wide choice of tread designs in each type and 6 different tread compounds for 6 different purposes in the solid tires. Only B. F. Goodrich has this complete line of types, compounds and sizes. *Today—mail the coupon for information on this new* and practical Tire and Wheel Analysis plan. A similar program is available for manufacturers of materials handling equipment.

The B. F. Goodrich Co.
Department TW-24
Akron, Ohio

Please give me additional information on your Tire and Wheel Analysis plan.

Name_____

Title_____

Company_____

City_____ State_____

Want Additional Product Information? See Page 19.

This WASHING MACHINE
HELPS CLEAN
YOUR FLOORS

Yes, you get cleaner floors at a lower cost because of a washing machine like the one illustrated above. This machine is used in testing the wearing qualities of mops in the Fuller Research Department. In this department the variables are removed from your floor mopping costs. Here, the three essentials of every good mop—long life, absorption, and rinsing speed—are scientifically controlled to insure uniformity. Only through positive standardization can *your* mopping cost be controlled. And only because of a research department like Fuller's . . . constantly checking, testing and inspecting . . . can quality be maintained. It adds up to better . . . and more economical . . . cleaning for you. Your Fuller Industrial Representative is no farther away than your telephone.

NOW AVAILABLE in limited quantities
Mops of Cellulose Yarn for Smooth Floors

INDUSTRIAL DIVISION
The FULLER BRUSH Co.

3554 Main Street • Hartford 2, Connecticut
In Canada: Fuller Brush Co., Ltd., Hamilton, Ont.

F.O.B. filosofy of buying

COMMERCIAL competition is borrowing the technique of the college boys. In recent weeks the "7 Up" delivery trucks around New York have been carrying big streamers with the slogan "Beat Chicago". The next step, we suppose, will be the slogan "Beat Dr. Pepper."

• •

FEATURED in the annual business outlook issue of the New York *Sun* (January 3) was a chart compiled by the National Industrial Conference Board, showing "What the Manufacturer Does With His Dollar". Of the five major classifications, cost of materials and services accounted for 67.2% of the total distribution of sales dollar income. Following in this order came compensation of employees (24.9%), corporate taxes (3.8%), profits retained (2.2%), profits paid out (2.0%). The explanatory caption stated: "The major part of the sales dollar is allocated for payments to suppliers. . . . Thus, in 1947, manufacturers' sales exceeded $188 billion, of which $126 billion, or about two-thirds of every sales dollar was required to pay for materials and services supplied by other enterprises." This, of course, is the important responsibility of the purchasing department, controlling expenditures greater than all the rest of the organization combined.

• •

ECONOMY minded Senator Byrd of Virginia is disturbed to find that the General Services Administration, set up by Congress at the recommendation of the Hoover Commission to save the nation 250 million dollars a year, has started out by adding considerably to the government payroll instead of curtailing personnel as expected. In reply to this criticism, GSAdministrator Jess Larson is quoted by Washington columnist Douglas Larsen as declaring that if GSA is going to do any saving, as per congressional instruction, it must have a lot more people. "We are setting out to do something in the government that has never been done before. (Saving—Ed.) It's a brand new function so naturally we've got to increase our staff to perform it. We're like a new business that has to live on the original investment for awhile before we can show profits. While we are studying ways of improving their (other agencies) methods, they've got to continue as usual and need all the personnel they have. . . . You've got to spend money to save money." Mr. Larson, according to Mr. Larsen, is by no means pessimistic on the chances of his new organization eventually saving money; he even goes so far as to say that the Hoover Commission's estimate of 250 million dollars a year is low. However, he thinks it won't be much before 1952 (Election year—Ed.) before real savings show.

• •

THE Department of Commerce issues a lot of interesting statistics on all sorts of things. They are particularly interesting if you stack up one set of figures against another. For example, in 1929, the cost of government was $10.2 billion, or just about half the amount expended on food throughout the country, $19.7 billion. Everything has gone up in the past twenty years, but not at an even rate. The 1949 figures show cost of government at $51.8 billion, and food expenditures at $52.9 billion, practically a photo finish, with government closing fast.

• •

CONSENSUS of the forecasters is that business will be good for at least the first half of 1950. This optimism is shared by the three major groups—professional economists, official Washington, and industrial executives. From there on, Group 1 says "tapering off".

Want Additional Product Information? See Page 19.

Group 2 says "total business year equal to 1949." Group 3 says, "Six months is a long way off. We'll wait and see what happens."

• •

CHARGES of "insubordination" have been preferred against City P. A. Cyril Buckley of Medford, Mass., by Mayor Walter E. Lawrence on the grounds that the buyer has stubbornly refused to award an order at $1,824 more than the low bid to acquire a pumper that the mayor prefers for the fire department. Claiming that the purchasing agent has exceeded his charter authority in refusing to abide by the recommendation of the executive officer, Mayor Lawrence is quoted as stating: "The job of the purchasing agent is to receive bids and cost evaluations, and then submit the information along with his recommendations to the mayor for final action." Either you have a purchasing clerk or a purchasing agent. The point at issue seems to be which of these alternatives is contemplated by the charter.

• •

ACTING Chairman Lowell Mason of the Federal Trade Commission, federal enforcement agency, finds his job rather confusing, with more than 2,200 separate and distinct prohibitory regulations on the books, telling the business man what not to do. "There is such a welter of laws governing interstate commerce," he says, "that the Government literally can find some charge to bring against any concern it chooses to prosecute. It's like playing 'pin the tail on the donkey', with everybody blindfolded, including the spectators."

One of the things that bothers Mr. Mason is the inconsistency of the laws. For example:

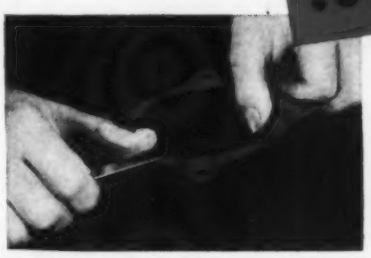
"In 1932, we put a pants presser into jail if he conspired to fix prices. In 1933, we put him in jail if he didn't. Next year, *vice versa* again.

"Later on, if he went into the coal business, we penalized him heavily if he didn't charge a fixed price. That is, if the coal were soft. If it were hard, *vice versa*.

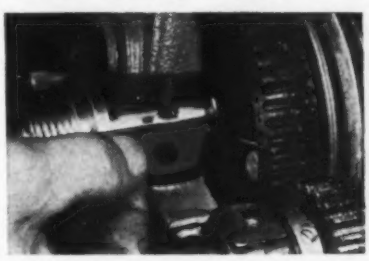
"We made the meat packers get out of the retail chain store business in 1920. But now, half a dozen retail chains are in the meat packing business. I guess the packers went into the wrong business first."

Most discouraging of all is the result. "I have yet to see a cease and desist order bring down the price of anything," he says.

LAMINUM* Shims give .002 inch accuracy WITH AS MUCH AS .063 inch tolerance



PRECISION ADJUSTMENTS by simply peeling .002 or .003 inch laminations. ***LAMINUM*** shims available in thicknesses from .006 to .126 inch.



FOR SPLIT BEARING of lathe headstock spindle. Even after peeling, shim is always uniform in gauge, with a hard, clean and smooth surface.

FOR THRUST BEARING adjustment of pump. Peelable shim is valuable for takeup of wear after service, reducing "down time" for maintenance.

...cutting lathe costs

...saving assembly time

Use laminated shims, stamped from ***LAMINUM***, to position machine elements accurately. With a .126 inch shim, made up of .002 inch laminations, for example, you have a full ⅛th inch of adjustment **built into** your assembly. There is NO filing or precision machining or grinding.

PLUS these advantages:

- All adjustments AT THE JOB.
- No fumbling or counting loose shims.
- No dirt, oil, grease between shim layers.
- Less compressible than ordinary one-piece shims.
- No new skill required for use.
- Can be fitted with babbitted lugs to prevent oil and pressure loss.

Send today for our new data file with specifications, design factors and applications. Sample of ***LAMINUM*** included. SEE OUR CATALOG IN SWEET'S FILE

STAMPING • GRINDING METALWORKING SERVICES

Press capacity to 100 tons, 24 inches square, shallow draw. Special equipment and variety of dies can eliminate die-making for short runs. Wide stock of materials. Let us quote on your *difficult* jobs.

* ***LAMINUM*** (Reg. U. S. Pat. Off.) shims are solidly bonded units made up of .002 or .003 inch brass or steel laminations with a microscopic layer of metallic binder. Cut to your exact specifications.

LAMINUM

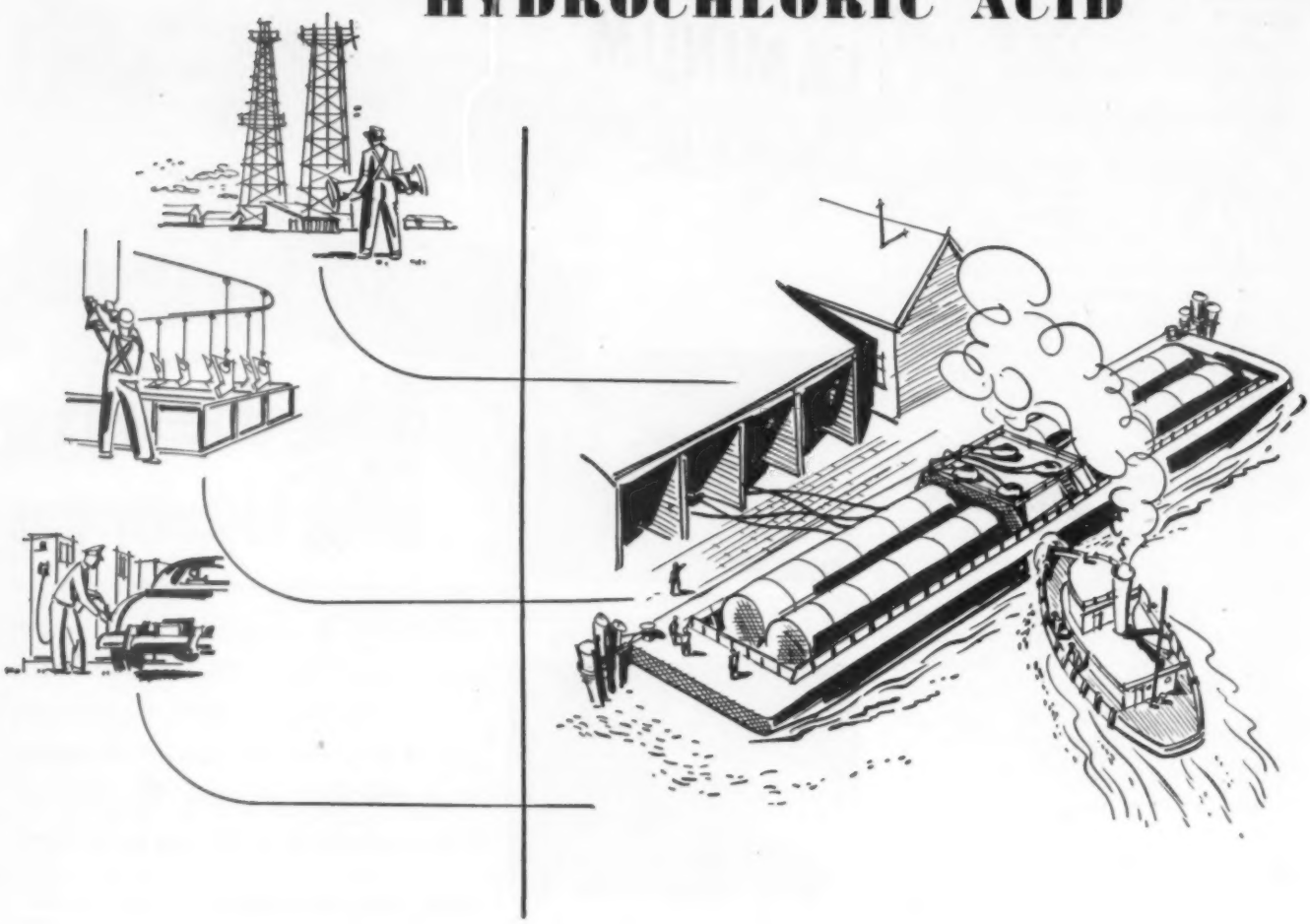
THE SOLID SHIM THAT peels FOR ADJUSTMENT

LAMINATED SHIM COMPANY, Inc.

2402 Union Street Glenbrook, Conn.

SHIMS SHIM STOCK STAMPINGS AN-COR-LOX NUTS

HYDROCHLORIC ACID



puts corrosion to work

The corrosive properties of hydrochloric acid are actually a boon to modern industry. HCl is widely used for treatment of oil wells to open rock formations, and for descaling of industrial heat exchange equipment. It also serves in the pickling and cleaning of metal products. Hydrochloric acid is used as an intermediate in the manufacture of ethyl chloride, essential to anti-knock fluid for gasoline.

America's stake in Dow hydrochloric acid is a big one! The above barge is one of several, each about 225 thousand gallon capacity, used to transport this acid from Dow's Freeport, Texas plant up the Mississippi and Ohio Rivers to Cincinnati, Ohio.

Look to Dow to satisfy your acid needs. For further information and technical assistance write us at Midland.

DOW ALSO PRODUCES over 600 chemicals including: caustic soda, phenol, aniline, monochlorobenzene, propylene oxide, epsom salt, ethylene oxide, and other basic, industrial, pharmaceutical and agricultural chemicals.

DOW

CHEMICALS

INDISPENSABLE TO INDUSTRY AND AGRICULTURE

THE DOW CHEMICAL COMPANY

MIDLAND, MICHIGAN

Want Additional Product Information? See Page 19.

Purchasing Previews

A Washington Report . . . . . for Purchasing Agents

February 1, 1950

SELLERS TESTING MARKET PRICE . . . .

Significant factor in the price picture is that while the general price trend is inflationary, there is a strong demand and expectancy on the part of consumers for lower price levels.

To meet this consumer demand, manufacturers are looking for substitute materials---new techniques---savings in finishing, where quality and sales appeal will not be reduced.

A general scramble by producers to maintain volume production by breaking into low---or lower---price tags for their products is still not immiment.

Considerable study is now being given to the effect of lower prices on volume. If volume of trade at the current price levels tends to fall off sharply, this will touch off a competitive trend toward lower prices at the consumer level.

SAVINGS THROUGH SUBSTITUTE MATERIALS . . . .

While greater efforts will be made to bring down prices of consumer items, this does not mean that costs can come down---except through operating economies, elimination of "gingerbread", substitution of materials, or redesign of product.

There has been a great deal of speculation about reduction of costs through increase in productivity. Actually, output per manhour has shown some increase where production is at a very high level.

Department of Labor report on the electric light and power industry shows productivity in that industry at a postwar high. Highest level of productivity was reached in 1944, when war industry required electric power at an unprecedented rate. At this stage, with volume at highest level, productivity was likewise at the highest level.

Point is that when volume slackens off, productivity drops. This means that to insure low unit costs, volume of sales must be maintained at peak level.

REALISTIC BUYING ANTICIPATED . . . .

Necessity of maintaining peak production to attain low unit costs has a similar impact on profit position of the manufacturer. Breakeven point is more quickly reached when rate of production slackens.

Significance here is that the market can shift rapidly. This suggests caution in purchasing. Market breaks in 1949, and the process of the last 18 months of working down inventory, are of recent memory. Upturn in some prices will not influence buyers toward speculative price purchases. Realistic buying to meet current requirements is generally anticipated.

CAUTIOUS OPTIMISM TYPICAL ATTITUDE . . . .

These basic conditions explain the widespread---but cautious---optimism that has been general with the new year.

Conditions currently are sound, and the outlook is for the movement of a large volume of materials and manufactured goods through the economy this year.

Uncertainty is traceable to the fact that there is less margin for error. Mistakes in purchasing, processing, design or merchandising will have greater and more immediate impact.

UNDERLYING INFLUENCE STILL INFLATIONARY . . . .

At the same time, the underlying influence on business will continue to be inflationary. Wages have gone up through the CIO pension drive, and the increase of from 10 to 12 cents an hour that these plans represent will now be sought by the AFL for its members.

Increase in steel prices will reflect in the cost structure of many products.

More important is the fact that the Administration is likely to maintain and even to stimulate a cheap money market. It is generally believed that Reconstruction Finance Corporation lending will be liberalized to permit broader Government guarantees of business loans.

UNIONS SPLIT ON PENSION ISSUE . . . .

Both the American Federation of Labor and the independent International Association of Machinists disagree strongly with the CIO on the advisability of industry-operated pension plans. CIO has made the pension issue its principal bargaining demand.

The Federation and the Machinists feel that this is a mistake——that pensions should be taken care of through broadening of the Government social security system——and that unions should stick to wage and working conditions issues.

GOVERNMENT RELATIONS WITH SMALL BUSINESS . . . .

Government agencies have been seeking some means of dealing with small business. Objective is two-fold——(1) to counteract trends toward monopoly, and (2) to stimulate employment in smaller plants in communities which have troublesome labor surpluses.

Industrial purchasing agents have faced a similar problem, and buy from smaller suppliers with the dual justification of maintaining alternate sources of supply and benefiting from the individual attention that a smaller supplier can give his customers.

The Government, on the other hand, cannot make purchases on the grounds that a small supplier can render either more convenient or special services. In fact, the very process of doing business with Government requires large administrative and clerical personnel which can only be provided by a large supplier.

So while the industrial purchasing agent has been able to make a rational adjustment in relation to suppliers large and small, the Government has been peculiarly rigid in its buying approach.

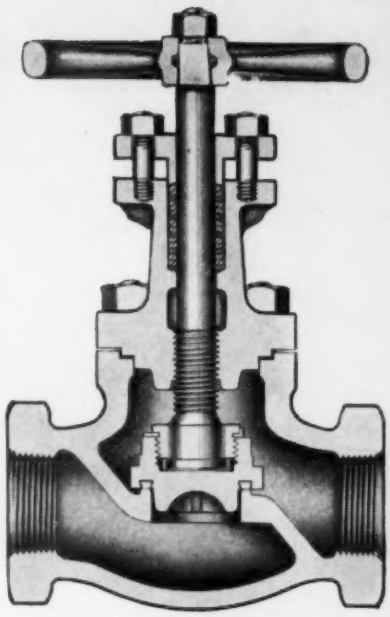
COMMERCE DEPARTMENT EMERGING AS SERVICE AGENCY . . . .

Assignment of Department of Commerce to work out an improved working relationship between the Government and business indicates policy decision to lay down the "big stick", substituting a new approach——informative rather than punitive.

Parallel in importance to the assignment to work out better relations between Government and business, was the study of national transportation policy made in the Department of Commerce.

The two assignments were indicative of the choice of the Department of Commerce as the service agency for direct contact between industry and Government. There is little argument over the logic of this choice, but question has been raised as to the adequacy of the personnel within the Commerce Department to properly discharge such a function.

ALL PIPING EQUIPMENT YOU NEED ...FROM ONE SOURCE OF SUPPLY



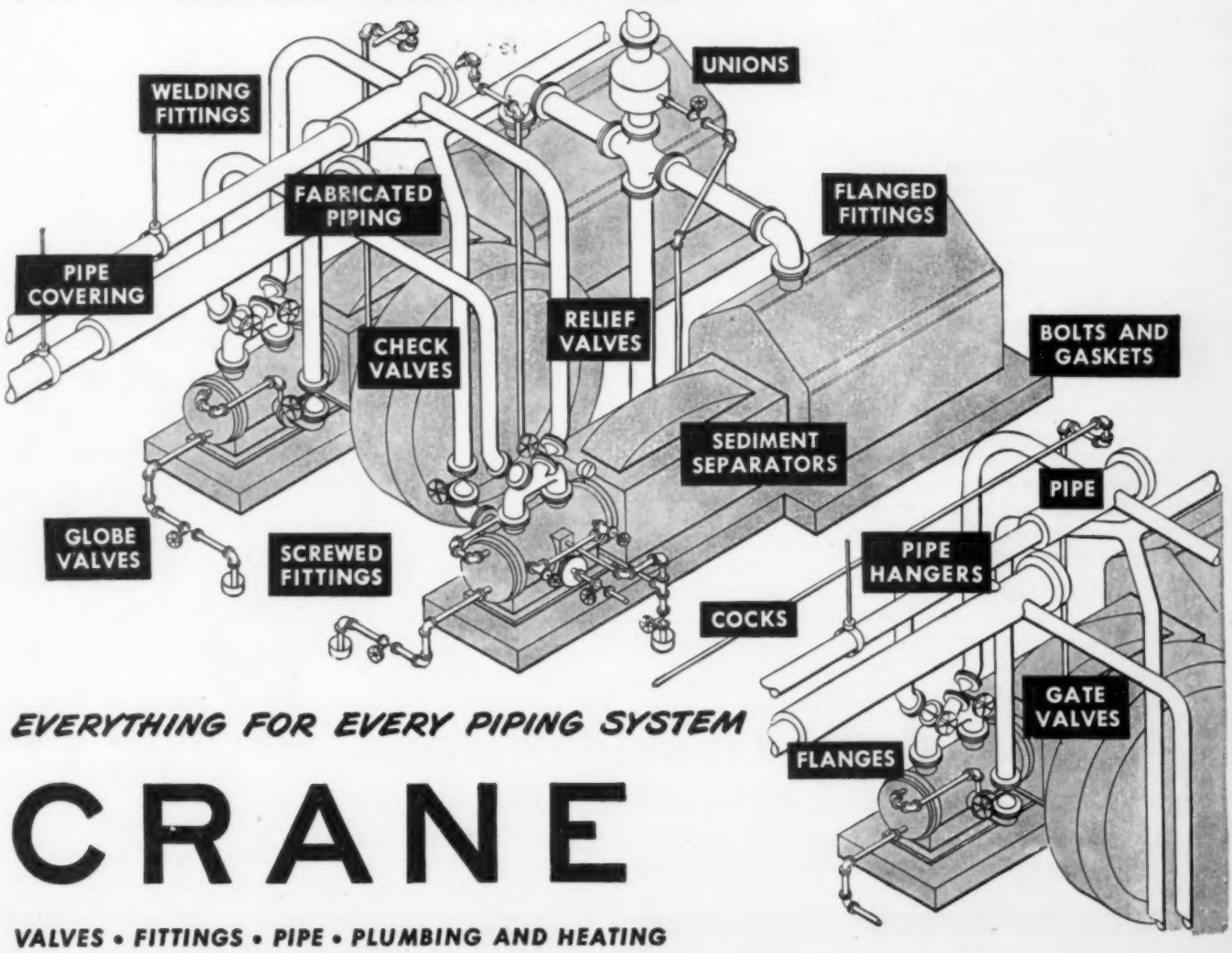
SAFER CONTROL FOR MANY SERVICES, Crane Ferrosteel Globe and Angle Valves—especially designed for high pressure ammonia refrigeration service—also find wide application on air, gas, oil and chemical lines where heavy, all-iron construction is desired. Special Crane seating design, rugged construction, and precise manufacture combine to make these valves safer, more efficient on all heavy duty services.

For volatile and hazardous fluids, these valves are supplied with a lead face disc specially designed for tight seating. For high temperatures and certain corrosive conditions, a case-hardened steel disc and seat can be supplied. Available with tongue and groove flanged ends, or screwed ends with extra long threads, and recessed for soldering. See your new No. 49 Crane Catalog, p. 394-5.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

WORKING PRESSURES:
300 pounds ammonia;
500 pounds oil, gas, or air up to 100° F.
Sizes: ¼ to 3 in.; Screwed or flanged ends.

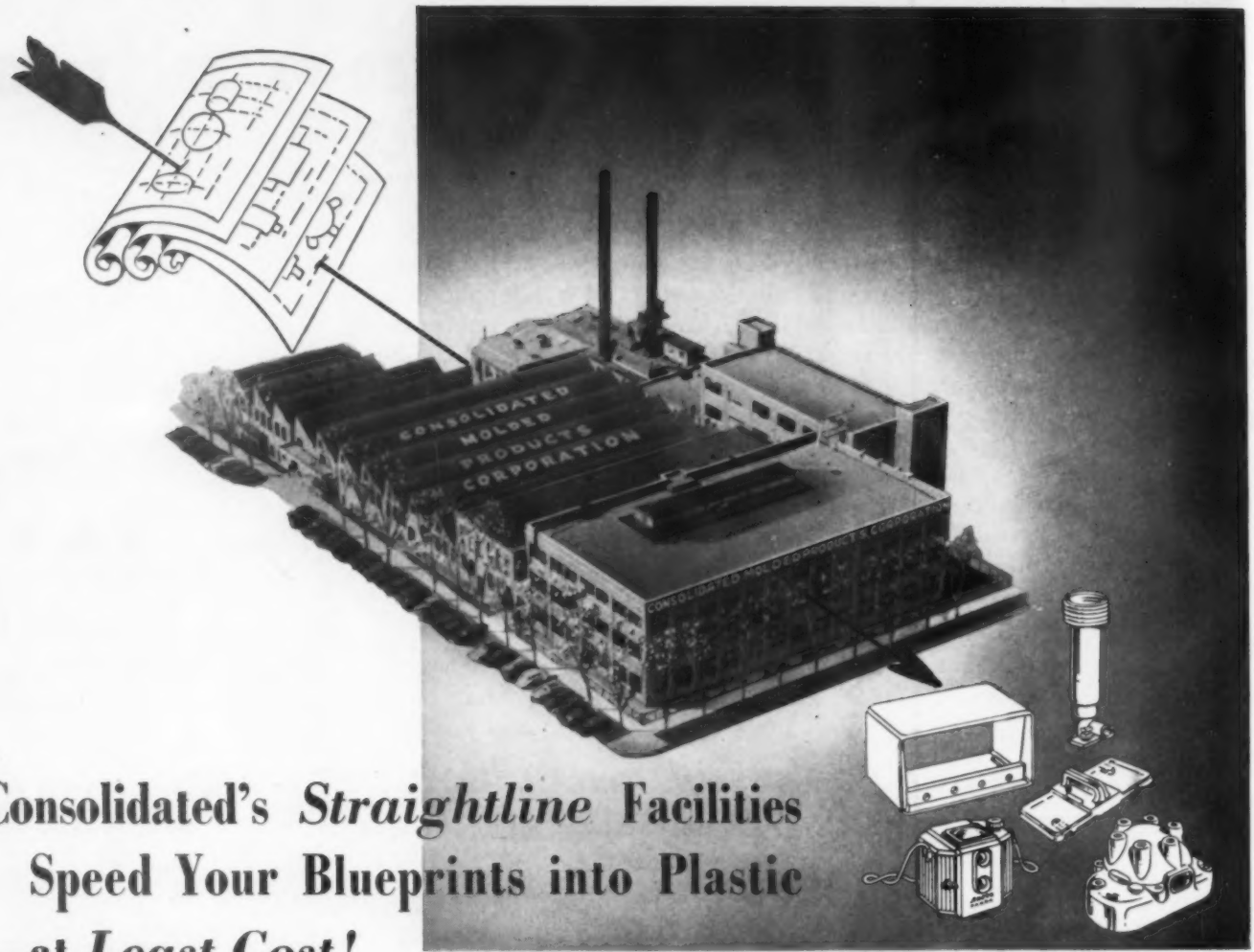
THIS AMMONIA COMPRESSOR INSTALLATION, FOR EXAMPLE, CAN BE COMPLETELY EQUIPPED BY CRANE



EVERYTHING FOR EVERY PIPING SYSTEM

CRANE

VALVES • FITTINGS • PIPE • PLUMBING AND HEATING



Consolidated's *Straightline* Facilities Speed Your Blueprints into Plastic –at *Least Cost!*

CURRENTLY, A foremost plastic materials supplier is investing good advertising money to bring home this thought . . . *"It pays to use your custom molder's know-how!"*

This timely bit of advice, so well given, is deserving of being equally well taken.

Here, at Consolidated, we offer manufacturers a degree of production know-how that is long on experience—advantageously diversified—desirably a complete under-one-roof responsibility – thoroughly dependable – alert – cooperative!

When we are asked . . . *"How much?"*—our answering bid usually reveals *"How little!"* With on-premise facilities in excess of a million dollars, we've what it takes to save you those important pennies per piece!

That the types of service we render can custom-fit your particular plastic requirements, is indicated by the customer confidence reposed in us by America's leading manufacturers in practically every field of industry.

Call in a Consolidated sales engineer . . . and do so during the early stages of your plastic thinking. His assistance–qualifications will enable you to plan properly . . . and profitably. Your inquiry is cordially invited!

Travel Consolidated's *Throughway* to Plastics Satisfaction

1 Product Design Cooperation
2 Experienced Mold Planning
3 Precise Mold Construction
4 Laboratory-Checked Materials
5 Selective Production Processes
COMPRESSION TRANSFER
PLUNGER INJECTION
6 Statistical Quality Control
7 Complete Finishing Facilities

Please address Dept. K-2

Consolidated *Molded Products Corporation*

***Plant & Executive Offices:* 309 CHERRY ST., SCRANTON 2, PA.**

Branch Offices and Representatives in* New York, Chicago, Milwaukee, Detroit, Cleveland, Bridgeport, Philadelphia—*and other principal cities

CMP

"Your Blueprint in Plastics"

New TIMKEN® "Double-Zero" bearing has twice the accuracy of any TIMKEN bearing ever made!

PRODUCTION BEING INCREASED TO MEET GROWING DEMAND AS "00" BEARING BRINGS NEW PRECISION TO MORE AND MORE PRODUCTS

Twice as accurate as the Timken® "Zero" bearing — previously the most accurate Timken bearing on the market — the new "Double-Zero" bearing offers industry great new opportunities for high precision. Run-out tolerance in the new "Double-Zero" is only 75 millionths of an inch!

This amazingly low run-out has resulted in quick adoption of the "Double-Zero" bearing for lathe spindles, grinding-machine spindles, small precision rolling mills, dividing heads, and gear cutting machines. And production of the "Double-Zero" has been repeatedly upped to meet the growing demand for greater precision.

The extremely high accuracy of the "Double-Zero" bearing has been made possible by The Timken Roller Bearing Company's development of new measuring devices, specialized machine tools, and improved manufacturing methods.

"Double-Zero" sizes and types are shown in the chart below. For more information write The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

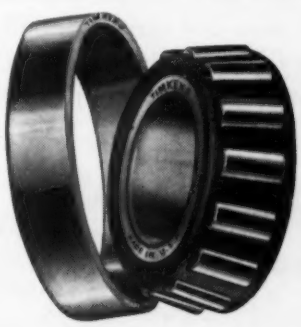
This symbol on a product means its bearings are the best.

A PRECISION TIMKEN BEARING FOR EVERY REQUIREMENT			
CLASS	**"00" (DOUBLE-ZERO)**	**"0" (ZERO)**	**"3" (THREE)**
RUN-OUT	.000075"	.000150"	.000300"
TYPES AVAILABLE	Standard Single Row	Standard Single Row	All types
SIZE RANGE	Up to 10" O.D.	Up to 12" O.D.	Up to 12" O.D.

TIMKEN

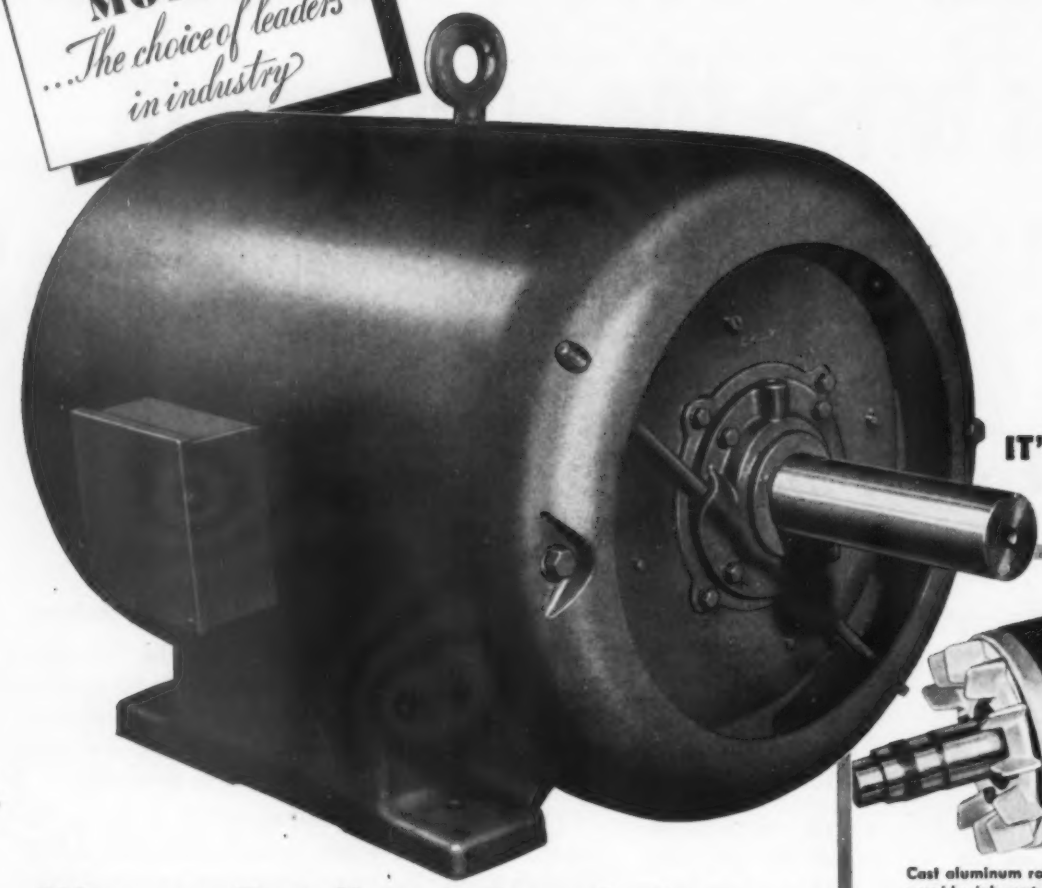
TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ↓ AND THRUST →◎← LOADS OR ANY COMBINATION →✳←

WAGNER MOTORS
...The choice of leaders in industry

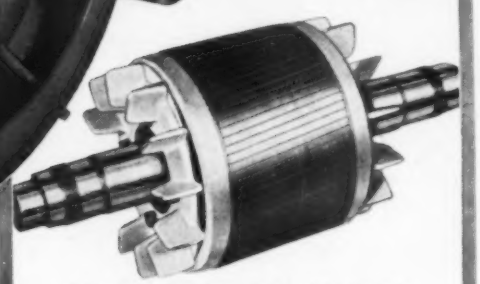


Wagner Totally-enclosed Motors *best* for really dirty jobs!

Wagner totally-enclosed fan-cooled motors are designed for a particular purpose—to operate efficiently and safely under conditions that would quickly damage an ordinary open type motor. In really dirty jobs—in atmospheres filled with dust, fumes, moisture, abrasives, steel chips and other harmful elements—these *protected* Type CP Motors keep on working, delivering dependable power with no maintenance other than periodic lubrication. Wagner totally-enclosed fan-cooled motors are varied electrically to suit a wide variety of application requirements.

Bulletin MU-185 gives complete information on Wagner Motors. Twenty-nine sales and service branches, in principal cities, are ready to help you on any motor problem. In addition, almost 500 authorized motor repair shops provide speedy, nationwide service facilities.

IT'S WAGNER ... *because:*



Cast aluminum rotors, pioneered by Wagner, provide inherent mechanical and electrical characteristics that add quality and dependability to Wagner type CP Motors.

The rugged frame, used on Wagner type CP Motors, has extra large air ducts around the entire stator to prevent clogging and to permit plenty of fan-driven air to cool the motor.

Wagner Electric Corporation
EST. WE 1891

WAGNER ELECTRIC CORPORATION
6360 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS – AIR AND HYDRAULIC

BRANCHES IN 29 PRINCIPAL CITIES

MU-1

Another BWH First!

NEW CONCORD #20 STEAM HOSE

(with Wire Braid Tube!)

BREAKS ALL PERFORMANCE RECORDS!

1. During grueling test, Concord #20 Steam Hose "took it" for 1980 continuous hours of service at 200 lbs. steam pressure!
2. No interruption . . . full flow of steam was maintained during the entire test period. Pressure remained constant at all times!
3. Absolutely no evidence of hardening or swelling of the tube!
4. Amazing new construction locks tube between two braids of wire . . . makes recoupling quick and easy!
5. Cover is oil, grease, heat, sun and abrasion resistant!
6. Flexible and DURABLE . . . Your nearest BWH distributor will be glad to demonstrate the whip-like flexibility of Concord #20.

HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems. We're specialists in solving them. Consult your BWH distributor or write us direct.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS., U.S.A. • P.O. BOX 1071, BOSTON 3, MASS.

Want Additional Product Information? See Page 19.

Here's what you get with

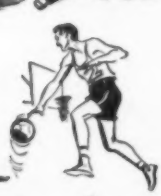
CHASE PHOSPHOR BRONZES

HIGH STRENGTH

HIGH FATIGUE-RESISTANCE

GOOD DUCTILITY

GREAT RESILIENCY



EXCELLENT CORROSION RESISTANCE

Here is a quick summary of some of the ways you can use Chase Phosphor Bronzes. It's a list well worth studying . . . for you may find these hard-working alloys can take on one of your own tough production assignments.

Chase Phosphor Bronze 5% (Grade A) is the most versatile. You'll use it for sleeve and thrust bearings, bellows, clamps, cotter pins, diaphragms, fasteners (snap and slide), lock washers, stranded cable, wire cloth . . . and that's only a fraction of the list of uses. Rod, Strip and Wire.

Chase Leaded Phosphor Bronze (Grade B) is what you'll specify for screw machine products, gears, spindles, valve parts, and the like. Rod only.

Heavy duty alloys are ***Chase Phosphor Bronze 8% (Grade C)*** and ***10% (Grade D).*** In Rod, Strip and Wire for use in heavy duty bearings, bridge bearing plates, diaphragms and springs (severe service).

444 Bronze is a free-cutting alloy for screw machine use, also for bearings, bushings, gears, shafts, thrust washers and valve parts. Rod or Strip.

CHASE BRASS & COPPER CO.
Dept. PU 250, Waterbury 20, Connecticut

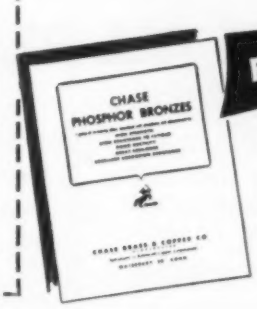
Please send me folder on Chase Phosphor Bronzes.

NAME_____ POSITION_____

COMPANY_____

STREET_____

CITY_____ STATE_____



FREE FOLDER

Mail the coupon for folder giving tables of properties (hardness, tensile, fabrication, physical) and of uses and forms.

Chase

the Nation's Headquarters for
BRASS & COPPER

WATERBURY 20 CONNECTICUT **SUBSIDIARY OF KENNECOTT COPPER CORPORATION**

THIS IS THE CHASE NETWORK . . . *handiest way to buy brass*

ALBANY† ATLANTA BALTIMORE BOSTON CHICAGO CINCINNATI CLEVELAND DALLAS DETROIT INDIANAPOLIS KANSAS CITY, MO. LOS ANGELES MILWAUKEE MINNEAPOLIS NEWARK NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH PROVIDENCE ROCHESTER† ST. LOUIS SAN FRANCISCO SEATTLE WATERBURY (†Sales Office Only)

Want Additional Product Information? See Page 19.

You've put your finger on it—

"Dependable"

You can say that again, Mister!

Wherever you see the Hevi-Lift, it's the same reliable workhorse — always ready to take over the heavy loads at the press of a button. You lift and transport anything up to 15 tons . . . and with 5-step variable speed control if you want it.

That's why hoist-wise buyers insist upon the Hevi-Lift for the vital jobs in production — to move their loads in less time, with less effort, at less cost.

The important point is this — the Hevi-Lift is *dependable*. Another product of P&H — America's largest builder of overhead materials handling equipment.

Handle it "thru-the-air" at lower cost!

CAPACITIES UP TO 15 TONS

These ADDED VALUES are Standard Equipment on P&H Hevi-Lifts

SAFER — P&H's true motor ratings insure against failure at full capacity loads and speeds. Thermal overload protection prevents motor burn-outs. Control current reduced to 110 volts at push-button. Crane-type limit switch and double brakes provide maximum safety.

LIFETIME CONSTRUCTION —Precision construction . . . shaved gears . . . grease sealed bearings . . . moisture, dust and acid-proof.

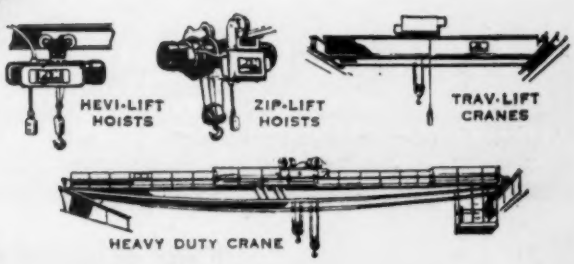
SMOOTHER OPERATION— Motor specifically built for hoist service; high starting torque, frequent reversal. Controls loads within a fraction of an inch.

P&H ELECTRIC HOISTS

4577 West National Avenue
Milwaukee 14, Wis.

HARNISCHFEGER CORPORATION

HOISTS · WELDING ELECTRODES · MOTORS · P&H · EXCAVATORS · ELECTRIC CRANES · ARC WELDERS



Need to see a man about a SPRING?

then call–

38 factory-trained field men in constant circulation!

WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT

THE WILLIAM D. GIBSON COMPANY
1800 CLYBOURN AVE.
CHICAGO 14,

RAYMOND Manufacturing COMPANY
CORRY, PENNSYLVANIA

BARNES-GIBSON-RAYMOND
6400 MILLER AVE., DETROIT 11,
and ANN ARBOR, MICH.

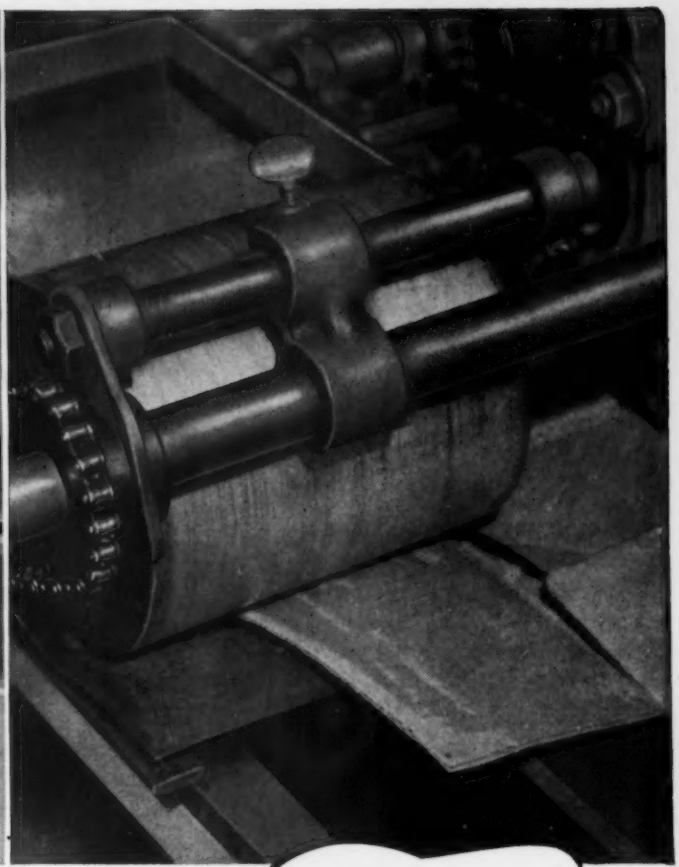
THE BEST SEVEN SOURCES FOR MECHANICAL SPRINGS

DUNBAR BROTHERS COMPANY
BRISTOL, CONN.

OHIO DIVISION
1712 EAST FIRST ST.
DAYTON, OHIO

THE WALLACE BARNES COMPANY LTD.
HAMILTON, ONT.
CANADA

U. S. DIVISIONS OF
ASSOCIATED SPRING CORPORATION
AND CANADIAN AFFILIATE



Seal CASES IN 20 SECONDS!

Paisley SCIENTIFIC ADHESIVE SERVICE

BOXEAL is the new *fast setting* Shipping Case Glue which tears fibres 15 to 20 seconds after application by brush or machine. Brings new high speed and efficiency to all production lines where short pressure time is essential. BOXEAL permanently seals all types of shipping boxes, corrugated, Fourdrinier kraft, jute, solid fibre. Non-toxic, odorless, stainless, and most of all . . FAST SEALING!

Get our complete laboratory report on Paisley BOXEAL and take advantage of the offer to send a trial 5 gallon shipment at the 55 gal. drum price available to all drum users of shipping case glues. We'll ship ON APPROVAL, F.O.B. our nearest plant, New York or Chicago. Fill in the coupon below, attach it to your letterhead, and mail it to us TODAY.

DON'T WAIT . . FILL IN AND MAIL THIS COUPON FOR GENEROUS TRIAL OFFER

Gentlemen: Please send complete information about Paisley BOXEAL Shipping Case Glue.

☐ You may send, on approval, trial 5 gal. shipment of "BOXEAL" at 55 gal. drum price.

☐ Send me a copy of Laboratory Report on "BOXEAL".

FIRM _____ STREET _____

CITY _____ ZONE ____ STATE _____ BUYER _____

PAISLEY PRODUCTS INCORPORATED

1770 CANALPORT AVENUE, CHICAGO 16, ILL. PHONE CANAL 6-2219

630 WEST 51st STREET, NEW YORK 19, N.Y. PHONE COLUMBUS 5-2860

Manufacturers of Glues · Pastes · Resin Adhesives · Cements and related Chemical Products

Try This Angle...

REDUCE YOUR UNIT COSTS

by Using Carpenter Stainless Tubing

This manufacturer really did something about reducing unit costs.

First, the problem of broken fishing rod guides was solved by changing to Carpenter Stainless Tubing, Type 347. And costly hand-polishing of parts was eliminated when the production job was worked out with Carpenter's help.

Now, in addition to low cost production of a stronger product, the manufacturer has an added sales feature in the corrosion resistance provided by Carpenter Stainless Tubing.

To improve your product, and at the same time take steps to reduce unit production costs, get in touch with your Carpenter Stainless Tubing representative or distributor. Call today.

THE CARPENTER STEEL COMPANY • Alloy Tube Division
122 Springfield Road • Union, New Jersey

Fishing rod guides "look like jewels" and are produced at low cost now that Carpenter Stainless Tubing is used.

USEFUL DATA FILE ON STAINLESS TUBING

This 12-page Carpenter Stainless Tubing Data File contains much of the basic information you need—available sizes, physical properties, corrosion resistance, etc. For your copy, write us a note on your company letterhead.

24-HOUR SERVICE ON YOUR ORDERS—You get *definite* delivery information within 24 hours when you call your Carpenter Stainless Tubing Distributor.

Carpenter

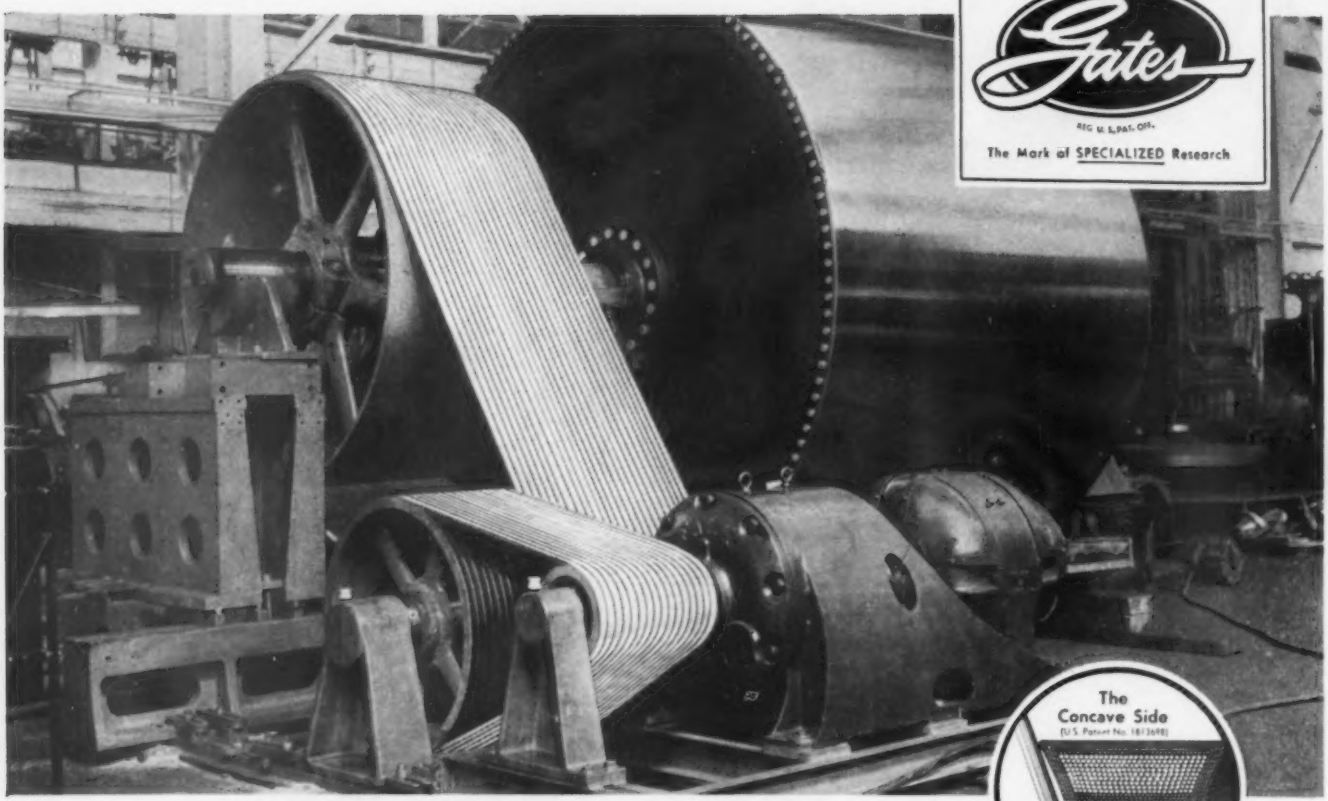
STAINLESS TUBING

"MORE THAN CORROSION RESISTANCE"

Artist – Herald G. Miller, native of Utah

UTAH—*annual purchases: $620 million, mostly packaged.*

CONTAINER CORPORATION OF AMERICA



This Gates Vulco Rope Drive has an unusual task. It revolves a 12-foot, 55-ton Drying Roll in a Roll Grinder at about one R.P.M. The double-reduction V-Belt Drive replaced gears because even at this slow speed the backlash of the gears resulted in chatter marks on the surface of the roll. The resilience of the Gates Vulco Ropes results in a smooth, mirror-like surface on the rolls.

Two Distinct *Savings* in *V-Belt Costs* Are *Yours* with Gates Vulco Ropes

A simple test that takes less than two minutes will save you many dollars in V-Belt costs. Here it is—

Have someone bend a V-Belt exactly as it bends in going around its pulley. As it bends, grip its sides with your fingers. You will *feel* those sides *change shape*. In a straight-sided V-Belt, the sides become *convex* as the belt bends. And note how the sides *bulge out*. (Figures 1 and 1A)

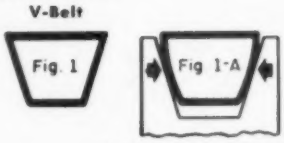
Now try the same test with a V-Belt that is built with the concave side. You will feel a change in shape—but a *different result!* The sides do not become *convex*. Instead, they become perfectly straight. *The bent belt now has a shape that exactly fits its sheave groove*—as shown in Figures 2 and 2A.

Two distinct savings result. *First*—There is no side-bulge to cause uneven wear. The sides press *evenly* against the V pulley and therefore wear *uniformly*—resulting in *longer life!* Second—The *full width* of the sidewall grips the pulley—thus carrying heavier loads without slippage—and this *saves belts* and also saves *power!*

When you buy V-Belts, be sure you get the V-Belt with the Concave Sides... the Gates Vulco Rope!

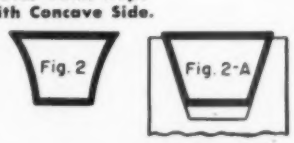
What Happens When a V-Belt Bends

Straight-Sided V-Belt



How Straight-Sided V-Belt Bulges in Sheave-Groove.

Gates Vulco Rope with Concave Side.



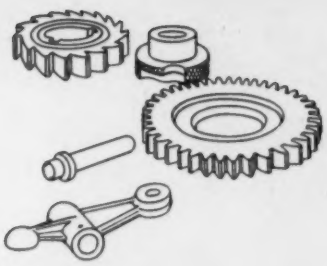
No Side Bulge. Precise Fit in Sheave Groove.

C. S. 501

THE GATES RUBBER COMPANY
DENVER, U.S.A.
The World's Largest Makers of V-Belts

GATES VULCO ROPE DRIVES
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

High Productivity Proved in Over 100 Production Tests



NOW READY FOR YOU

V1 BOND

INTERNAL GRINDING WHEELS

A marked increase in efficiency in all types of internal grinding is provided by these new V1 Bond wheels. In a variety of materials and applications, the number of pieces per wheel have been substantially increased. A new process insures better duplication, better grinding action, and shorter delivery time. These wheels are equally efficient from starting diameter to minimum usable size. The Carborundum Company, Niagara Falls, New York.

CHECK THESE 5 POINTS

- **More pieces per wheel.**
- **Faster, freer, cooler cutting.**
- **Lighter dressing—longer diamond tool life.**
- **Greater range of work from one grade.**
- **Improved surface finishes and closer tolerances.**

BONDED ABRASIVES BY

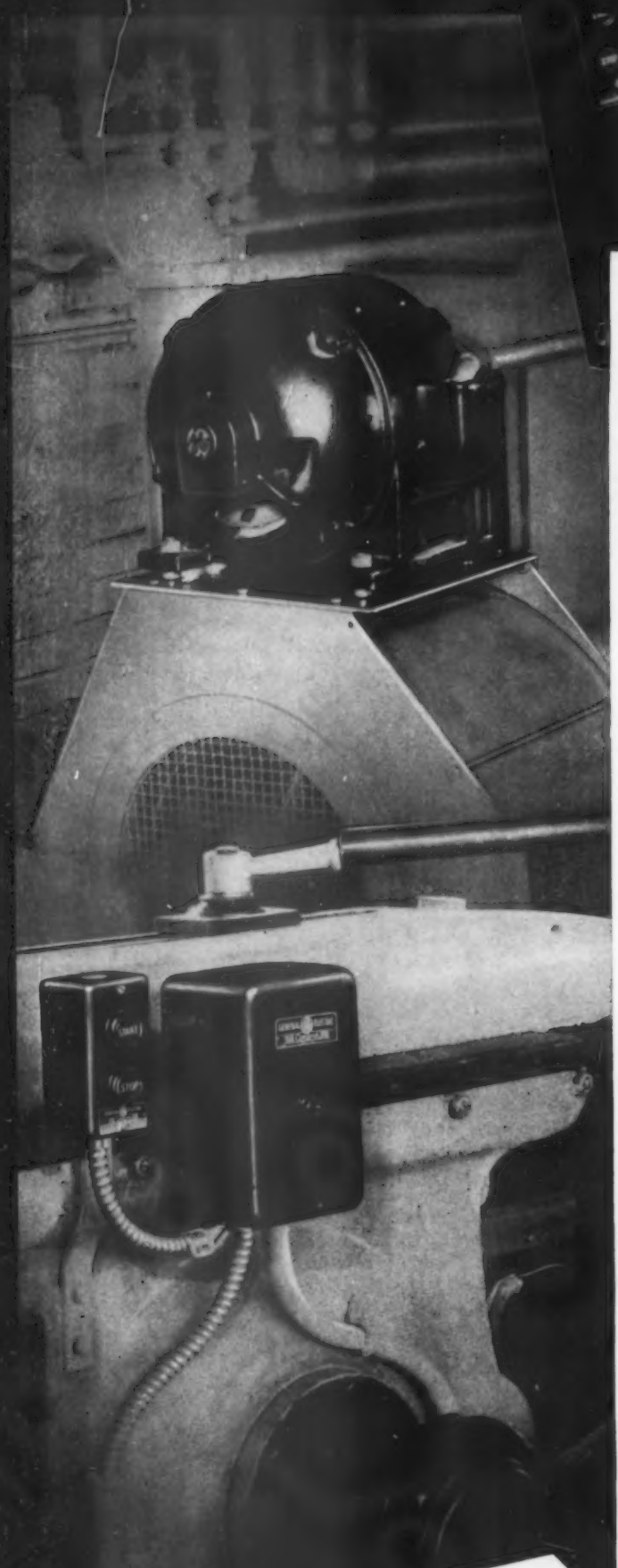
CARBORUNDUM

TRADE MARK

Contact Carborundum's nearest office or distributor to avail yourself of these benefits.

Branch Offices in: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, Jersey City, Philadelphia, Pittsburgh, St. Louis, San Francisco.

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company



POWER

EXACTLY AS YOU WANT IT!

Motors by G. E.

Whether you need a 5-hp motor for your plant or a 1/100-hp motor for your product, Graybar can provide the best one for the job. We distribute G-E motors, of which there are more in use than *any* other kind. That's because—AC or DC, general- or special-purpose—they deliver the power you want, smoothly and steadily. G-E "Tri-Clad" motors have extra protection against physical damage, electrical breakdown, and operating wear.

Magic Controls

Yes, they work almost like magic! There are proper G-E controls, distributed by Graybar, for making any motor obey your bidding. Even the smallest hand starter has a toggle that flips to mid-position, automatically shutting off the motor in case of overload. Magnetic starters, for remote or automatic control, are available in a range of types. Electronic "wizards" such as the Amplidyne can be supplied for special needs.

POWER SPECIALISTS

Graybar Power Apparatus Specialists are expert in selecting and applying the right motors and controls for specific tasks. The nearest Specialist can help you or your electrical contractor, too, in planning the best use of equipment for intra-plant power distribution.

You can get prompt delivery of motors, controls, and many other electrical items from stocks at a near-by Graybar warehouse.

FREE—16-Page Booklet on Controls

5011A

GRAYBAR ELECTRIC COMPANY, INC.
420 Lexington Ave.
New York 17, N. Y.

Please send me a copy of "Simplified Guide to the Selection and Application of Commonly Used Types of A-C Motor Controls."

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

You get the best of everything electrical
Via Graybar

PURCHASING

The National Magazine of Industrial Procurement

VOL. 28, NO. 2 FEBRUARY, 1950

The Business of Government		**83**
Report on Britain—3. State Monopoly on the March	*S. F. Heinritz*	**87**
PURCHASING Reports on Purchasing Opinion What Is the Outlook for Capital Goods?		**95**
"Public Relations" Is Everybody's Business	*R. N. Patrick*	**97**
Graphic Records in Receiving Inspection	*W. A. MacCrehan, Jr.*	**99**
Coordination for Control of Engineering—Purchasing—Production	*F. M. Burt*	**102**
Visiting a Vendor's Plant	*E. L. Cady*	**106**
Purchasing Textiles	*Irving Teplitz*	**109**
How to Buy Zinc	*Henry Toy, Jr.*	**111**
Where We Stand Commodity and Business Trends		**121**
How to Buy a Lighting System	*D. H. Tuck*	**129**
Does Money Grow on Trees?	*Grey Leslie*	**133**
Paring Costs with Pallets	*D. G. Baird*	**136**
Purchasing Organic Coatings	*T. A. Dickinson*	**140**
Liability for Misrepresentation	*Leo T. Parker*	**142**

MONTHLY FEATURES

Ask "Purch", New Trade Literature	**12**
F. O. B.	**62**
Purchasing Previews	**65**
New Products — Ideas	**148**
Office Equipment and Supplies	**211**
Among the Associations	**230**
Personalities in the News	**264**
Letters to the Editor	**308**
Buyer's & Seller's Mart	**310**
Index to Advertisers	**312**

STUART F. HEINRITZ .....EDITOR

B. P. MAST .....*Chairman of the Board*
HARVEY CONOVER .....*President and Treasurer*
A. M. MORSE, JR. .....*Vice President and Manager*
A. H. DIX .....*Vice President, Research*
GILBERT B. FERRIS .....*Secretary*

EDITORIAL STAFF

GEORGE E. HENRY .....*Associate Editor*
PAUL V. FARRELL .....*Associate Editor*
A. N. WECKSLER .....*Washington Editor*
L. E. McMAHON .....*Production Manager*
E. C. ARINK .....*Art Director*
DAVID BURKE .....*Associate Art Director*

ADVERTISING REPRESENTATIVES

ALEX G. GRAAM .....*New York*
RAY RICHARDS .....*New York*
C. R. KINGSLEY .....*New York*
WAYNE W. GEYER .....*Chicago*
H. L. PELOTT .....*Chicago*
RICHARD C. GROVE .....*Cleveland Manager*
FORREST C. PEARSON .....*West Coast Manager*
EDWARD M. BUCK .....*Southern Representative*

EDITORIAL AND EXECUTIVE OFFICES

205 East 42nd Street, New York 17, N. Y.

BRANCH OFFICES

737 NORTH MICHIGAN AVENUE ....*Chicago 11, Ill.*
435 LEADER BUILDING .....*Cleveland 14, Ohio*
5478 WILSHIRE BLVD. .....*Los Angeles 36, Cal.*
NATIONAL CITY BUILDING ....*Dallas 1, Texas*
NATIONAL PRESS BUILDING .....*Washington, D. C.*

Published monthly by Peeaye, Inc.
Subsidiary of
CONOVER-MAST PUBLICATIONS, INC.
Printed at Orange, Conn.

CONOVER-MAST PUBLICATIONS
PURCHASING
AVIATION OPERATIONS
MILL & FACTORY
CONOVER-MAST PURCHASING DIRECTORY
LIQUOR STORE AND DISPENSER
CONSTRUCTION EQUIPMENT AND MATERIALS

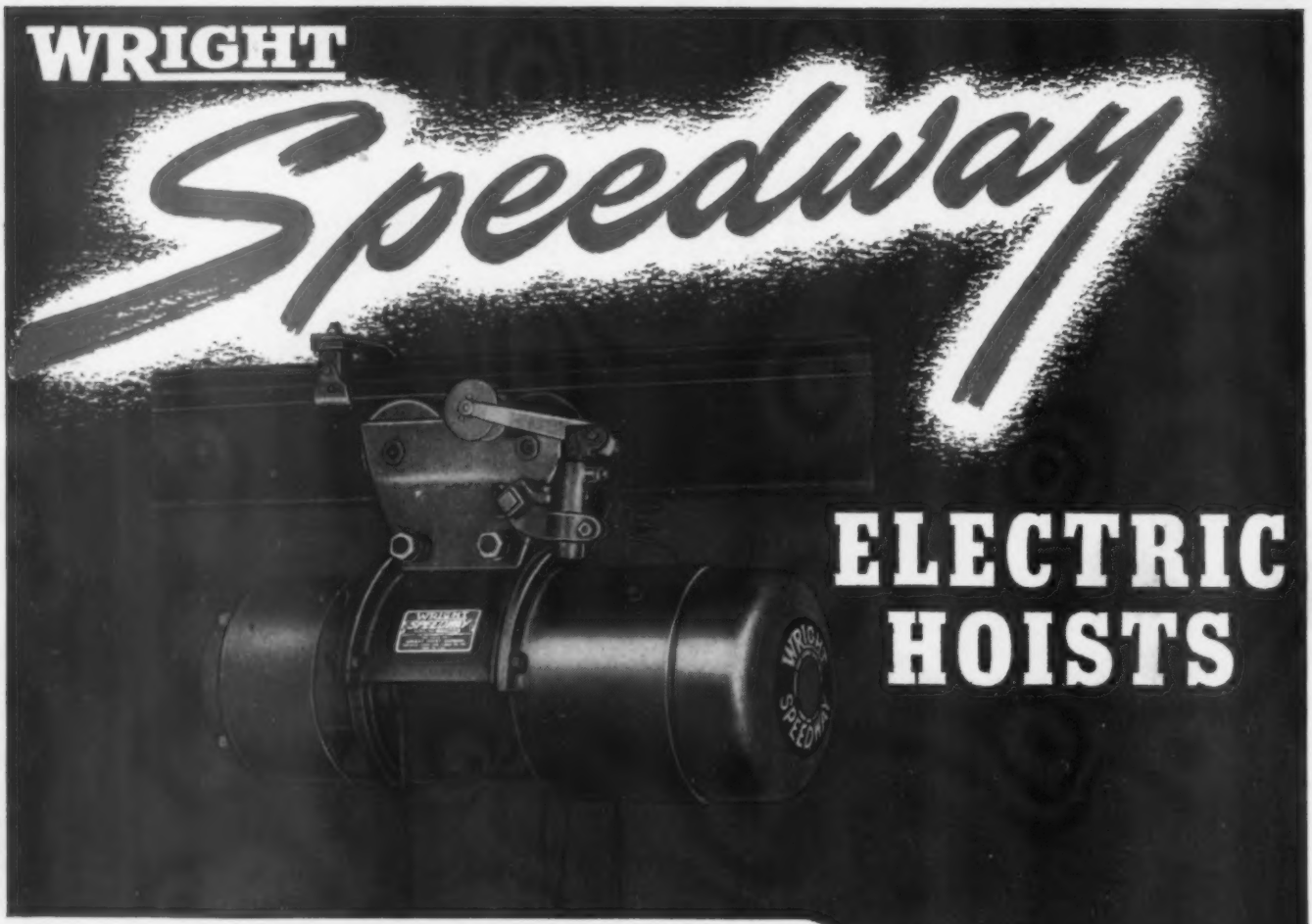
Copyright 1950 by Peeaye, Inc., in the U.S.A.

PURCHASING is an independent journal, not the official organ of any association. Established 1915 as "The Purchasing Agent". Consolidated with "The Executive Purchaser".

Contents are indexed monthly and annually by the Engineering Index Service.

Subscription rates: United States, U. S. Possessions, and Canada: $4 per year, $6 for two years; elsewhere: $6 per year, $10 for two years. Single copies, 50¢.

WRIGHT *Speedway* ELECTRIC HOISTS



UP TO 10-TON CAPACITY...
in a wide range of speeds, lifts, mountings

Send for this folder

Your nearby Wright Distributor or Wright District Office can supply you with complete information about the line of Speedway Electric Hoists. Ask for your copy of folder **DH-65.** *If you prefer, write to the factory at York, Penn.*

SAFE–EFFICIENT–RUGGED–ADAPTABLE

● The WRIGHT *Speedway* line of electric hoists rates high with Safety engineers, maintenance and production men.

The same is true of Wright Hand Hoists, Trolleys and Cranes.

Remember WRIGHT—
"The Line With the Good Name"

ACCO

York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

WRIGHT HOIST DIVISION
AMERICAN CHAIN & CABLE

HOISTS TROLLEYS CRANES

TRADE MARK

In Business for Your Safety

The Business of Government

THE Hoover Commission's well considered recommendations for economy and efficiency in government administration, developed at the suggestion and invitation of government itself, have apparently found just as much—or just as little—welcome and acceptance at the White House as did the Taft-Hartley Act. And the Hoover report is being as little used.

With government demonstrating an increasing yen to get its fingers into business affairs, it would be encouraging to see a little businesslike thinking get into government affairs. But the President's budget message gives little encouragement on this score. On the contrary, it shows either a complete lack of comprehension or a callous disregard of the policies that could put management of the nation on a sound and solvent basis.

The smiling plea, "But where shall we cut?"—designed to arouse the vicious forces of self-interest—overlooks the fundamental principle that competent management doesn't aim at doing less, but at doing more—more efficiently. When the policy is merely the easy road of doing more—more extravagantly, there is real danger ahead.

The issue is squarely one of spending for the sake of spending, which is vaguely expected to result in a brisk, expanding economy with good times for all while piling up bills for a future generation to pay, or concentrating on the objectives which are the measure of effective spending.

There are few thinking people who are not aware of the necessary growth of government in a growing country, and of the rising costs that are a factor in any enterprise. That should be a challenge to scrutinize what we are getting for the expenditure and to improve performance. Industry faces the same problems, and responds by checking waste and getting more production and more value per dollar. The same thing can be done in government. The way has been charted. It will not be done until top management demands it and sets the example.

This is the difference between spending and purchasing. We need more of the scientific purchasing philosophy and method in Washington today.

Stuart F. Heinritz

Check COLUMBIA'S facilities for supplying

PARA-DICHLOROBENZENE
All standard mesh sizes
25, 50, 100 and 200 lb. fiber drums

ORTHO-DICHLOROBENZENE
55 gallon drums 8,000 gallon tank cars

MONO-CHLOROBENZENE
55 gallon drums 8,000 gallon tank cars

These chlorinated benzenes are available for immediate shipment in any quantity, including mixed cars with other products. You may find many desirable advantages for your business by using Columbia facilities—at least, it's worth checking. Do it now . . . contact our nearest district office, or write Pittsburgh Plate Glass Co., Columbia Chemical Division, Fifth at Bellefield, Pittsburgh 13, Pa.

COLUMBIA CHEMICALS

CHICAGO · MINNEAPOLIS · BOSTON
NEW YORK · CINCINNATI
ST. LOUIS · CHARLOTTE · PITTSBURGH
CLEVELAND · PHILADELPHIA

PAINT · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

Highlights

This issue's important features summarized for the busy reader

One person out of every 8.8 in Britain today is on the government payroll—not one of every 8.8 workers, but of total population. To visualize this: if you live in a city of 100,000 population, think of having 12,000 people in the employ of the state. Britain has clamped a **Government Monopoly** on commercial aviation, cable and wireless service, electric power production, gas, the railroads and trucking, and on coal. Steel is due to be nationalized this year. To follow are: shipbuilding, cement, sugar refining, and insurance. All but one of the government enterprises are running at a loss. How government rates in management, how industry and the consumer fare under the system, and what the situation is leading to, are told in the article on page 87, third in the series of reports by PURCHASING's editor on his first-hand study of conditions under the laborite administration in Great Britain.

The third of NAPA's "How to Buy" prize papers appears on page 111 of this issue. It is a comprehensive and basic treatise on **How to Buy Zinc.** The diversified products derived from zinc ores and their widespread uses in a variety of industries present a complex purchasing problem of market evaluation. Here is the essential information on sources and processes and marketing that the buyer needs.

This month's **Guest Editorial** (page 97) is contributed by R. N. Patrick, NAPA Vice President for District 7. It deals with the important topic of "Public Relations", a phase of business affecting every department of the organization, with a particularly fine opportunity for the purchasing agent to make a constructive contribution to his company's welfare.

A **Lighting System** is more than a layout of wires and bulbs. For real efficiency and satisfaction, it involves a knowledge of the different types of lighting available for a particular set of conditions, and a comparison of installation and operating costs to get the utmost value. On page 129, a lighting engineer shows how these factors can be evaluated, and has illustrated his points with a case study of an industrial lighting problem, with comparative analysis of five possible solutions.

Have you neglected **Quality Control** methods because they seem over-technical? You may change your mind after reading the article on page 99, which shows how the science can be applied in revealing graphic form that makes the inspection and receiving report a highly informative and useful tool in improving and maintaining adequate quality of purchased items and providing a common language for supplier and buyer.

Palletized Loads are not the answer to every materials handling problem, but they have helped substantially in a great many cases. The story on page 136 reports on the experience of Chrysler Corporation with this packing and shipping method. Profit by their experience.

While everybody is talking about the new materials of industry, one able scientist who combines realism and imagination has predicted that industry will increasingly seek its material needs from the oldest source of all—wood from trees. While we have been shamefully wasting our forest resources in the past, this is a crop that careful and intelligent cultivation can restore. The wealth of the forest industries, he predicts, will come from the by-products that are now wasted. Read, on page 133, his fascinating and optimistic story as reported in the review entitled **Does Money Grow on Trees?**

What do you look for when you visit a **Vendor's Plant?** What do you see? What do you remember? How do you use the information gained? Ned Cady, on page 106, tells how to get the most from such inspection visits. His recommendations go back to the sort of preparation you should have, and include the critical points in a plant where your attention should be focussed. Don't fail to read this article before you make your next trip to a vendor's establishment or join a plant visitation group.

Practical information to aid the buyer is included in two commodity articles in this issue. One of these deals with an old product—**Textiles** (page 109)—where complicated trade customs have been established through years of usage. The other deals with the relatively new developments in the field of **Organic Coating Materials** (page 140).

Are you making full use of these monthly departmental features compiled especially to keep you informed on recent industrial developments? A selected list of new **Trade Bulletins and Catalogs** that are yours for the asking (page 12) and the illustrated summary of **New Products and Ideas** (page 148) will help you keep abreast of industrial progress.

Waiting for steel mill deliveries?

Let Ryerson bridge the gap!

The ending of the steel strike left Ryerson stocks in much better shape than we had expected. At our thirteen conveniently located plants large and varied supplies are available right now for steel users awaiting mill shipments.

Among the many carbon, alloy and stainless steels we have on hand for immediate delivery may be just what you need to tide you over—until those delayed mill shipments begin to roll in. In all probability we can help you bridge the gap in supply.

So if you need steel contact our nearest plant by phone, wire or mail. The results may surprise you.

PRINCIPAL PRODUCTS

BARS—Carbon & alloy, hot rolled & cold finished
SHAFTING—Cold finished, ground and polished, etc
STRUCTURALS—Channels, angles, beams, etc.
TUBING—Seamless & welded mechanical & boiler tubes
STAINLESS—Allegheny plates, sheets, bars, tubing, etc.
PLATES—Sheared & U. M., Inland 4-Way Floor Plate
SHEETS—Hot & cold rolled, many types & coatings
MACHINERY & TOOLS—For metal working

RYERSON STEEL

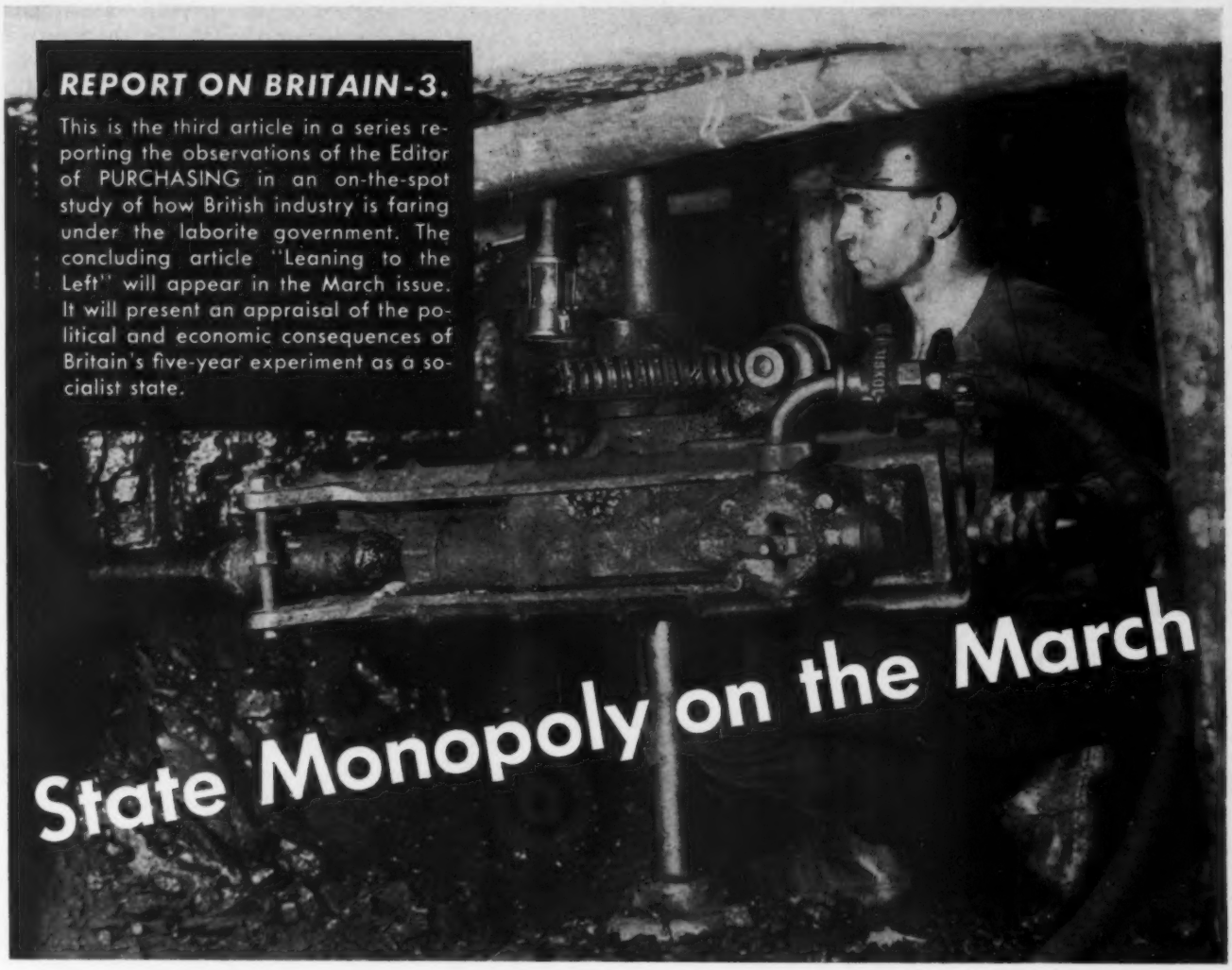
RYERSON CERTIFIED STEELS

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

Want Additional Product Information? See Page 19.

REPORT ON BRITAIN-3.

This is the third article in a series reporting the observations of the Editor of PURCHASING in an on-the-spot study of how British industry is faring under the laborite government. The concluding article "Leaning to the Left" will appear in the March issue. It will present an appraisal of the political and economic consequences of Britain's five-year experiment as a socialist state.



State Monopoly on the March

Three-quarters of a million British coal miners are producing less under government management, at greatly increased cost. The domestic consumer is paying more for his coal, and export trade is down to one-third its former volume.

Britain's nationalized industries show consistent record of mismanagement and deficits

Program of further nationalization will take over steel, cement, shipyards, sugar, chemicals

It's easy for the state to seize an industry, but denationalization is a difficult process

•

By Stuart F. Heinritz

THE British term for allocation and similar economic controls is "rationalisation". This is a self righteous word, implying justice and virtue, as well as logic, in the system. By the simple change of the initial letter it becomes "nationalisation". In the philosophy and vocabulary of the socialistic administration, this is also a self-righteous word, for it is a basic, essential part of the party program. And the change is very readily made.

The British government has gone into business in a big way since the laborite party came into power five years ago. The state today is, by a wide margin, the largest employer in the nation, with 5.7 million persons on the government payroll out of a total population of 50 million. Of these, approximately one million have been added to the staffs of government administrative bureaus, which are now twice as big as prewar; 2.5 million are the employees of nationalized industries and public services, a laborite project.

Nationalization of industry, as opposed to private enterprise and ownership, has ranked high on the laborite agenda from the very beginning. Prior to the 1945 elections, the telephone and telegraph communication systems were government operated, as is the case in most European countries. In 1946, within one year of the laborite rise to power, the government took over the Bank of England, civil aviation, and the cable and wireless services.

The road to frustration. Here is the first of a shipment of 750 Bedford trucks, bulldozing and railway equipment, en route to the great Ground Nut Scheme, in which the laborite planners sunk $95,000,000 in the East African jungle to produce 5,000 tons of peanuts at $9.50 per pound.

Photographs by courtesy of the British Information Services

In 1947, the coal industry, inland transport (railroads, busses, and canals), and the electric power industry were nationalized. In 1948, the gas producing industry was added to the list.

Up to this point, there is a certain logical pattern in the program. The activities and services affected, with the exception of coal mining, can all be classified under a broad definition of "public utilities", and public ownership of utilities has long been a debatable subject the world over. In Britain, as in the United States, a considerable number of the electric and gas utilities and local transport services were already under municipal ownership and operation before the central government took over on a national scale. Our own government is extensively engaged in electric power development and service, with futher major projects under consideration. To date, however, our operations of this sort have been in localized areas and at least nominally in competition with private enterprise.

When we come to the case of the coal industry, however, the matter enters another phase. The reasoning and the definition are projected from "public utility" to "public interest". We have heard the same term, and the same proposal of government operation, tentatively mentioned in connection with our own coal and steel industries at the time of the 1949 strikes; we had a brief experience with government administration of the railroads during World War I, and emergency legislation during World War II set up the machinery for government acquisition and management of essential plants; our federal government is currently engaged in the commercial production of synthetic rubber, and has a creditor's interest in scores of other industrial enterprises, large and small. Before we go too far in accepting the plausibility, propriety, and practicability of this trend, we shall do well to examine the experience of Britain, where the experiment of nationalization is in full swing.

No one can deny that a strong element of public interest exists in Britain's coal industry, beyond the general public and national interest of any nation in having a healthy industrial economy. Aside from its importance as a domestic living necessity, coal is Britain's chief natural material resource. It is the basis of the cheap power upon which all of British industry depends, the essential material for the electric and gas utilities, the fuel for rail transport, and an important raw material for the chemical industry. Furthermore, coal mining is a dominant factor in the nation's social and economic structure, with approximately three-quarters of a million men normally employed in the mines. This is obviously important from the standpoint of employment and living standards. It also involves a real problem of essential operation and production, because coal mining as a career has lost much of its appeal for the present generation. City billboards are liberally plastered with posters blazoning forth the alluring slogan: "There's a future for YOU in coal mining."

Yet coal mining is still primarily an industrial operation rather than a public service. When it was taken over by the government, a clear pattern was established for extending the principle of nationalization into broader fields of industry which are currently doing very well indeed—for themselves, for their employees, and for the nation—under private ownership, and where the argument of national and public interest carries far less conviction and weight.

This program of industrial nationalization for its own sake, as a political objective, is no secret, and the schedule is well known. Nationalization of the steel industry was voted in the closing months of 1949, after a prolonged delaying action in the conservative House of Lords, and it will become effective during the coming year if the laborites are returned to power in the 1950 elections. Also earmarked for nationalization are: insurance, sugar refining, cement, shipbuilding, and basic chemical industries. The economic need for such action, and the element of public interest involved to justify such a course, become less and less rational as you go down the list. How much farther the program will go is anybody's guess.

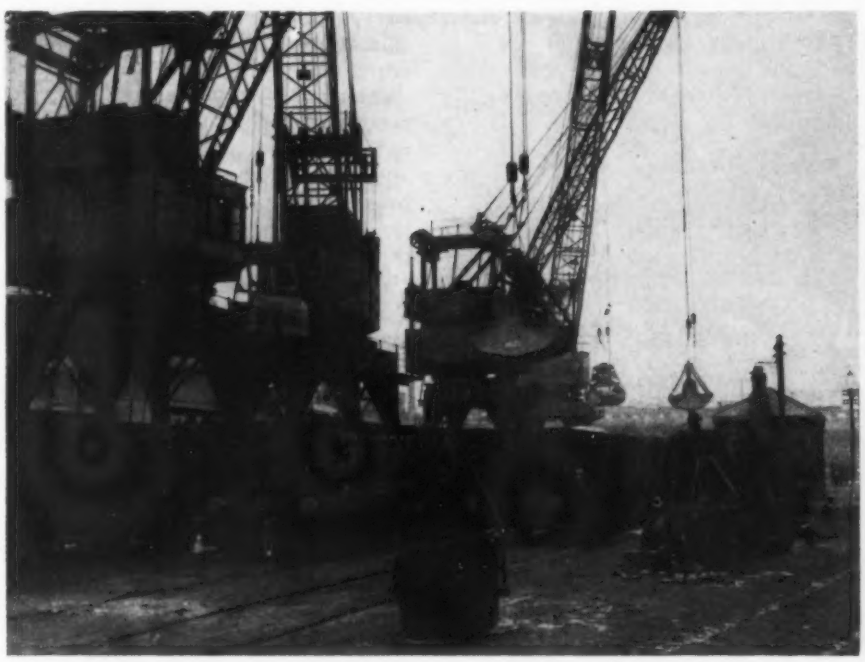
Government as Manager

The government's record in the role of entrepreneur is not an impressive one, either as to accomplishment or even ordinary competence. The now famous "Ground Nut Scheme" launched in 1947, which had the laudable objective of remedying the nation's shortage of edible oils by the development of a 600,000-acre peanut plantation in the African jungle, has turned out to be a colossal $95,000,000 fiasco, amounting to a national scandal. As conceived, and according to the prospectus, it was a sure thing. It was planned in the most minute de-

tail—financing, managerial and operating staffs, schedule and cost of development, and quotas of production. But in two years of government management, the appropriation has been exhausted, the project is 92% behind schedule, and total production has amounted to only 1/10 of the quota—5,000 tons of peanuts at $19,000 per ton. No Board of Directors in private enterprise would survive such a sorry record.

I saw at first hand an example of the government's ineptitude for commercial management in a more conventional line of manufacture, where direct comparison with private enterprise is possible. Three years ago, the state went into the prefabricated housing business. The original schedule called for production of 7,000 units, to sell at £1,800 each, exclusive of land. The government reconverted a wartime airplane plant and subcontracted the fabrication and transportation at approximately £1,000 per unit. The expected sales did not develop, despite the acute need for housing, which is not surprising in view of the fact that the price was higher than for permanent on-the-site construction of comparable units. Failing in competition, the project was abandoned half-way through. The subcontractor bought the tooling, added copper plumbing fitments and other improvements, and, using the same fabrication costs as under the government contract, profitably completed the program and sold the houses at a delivered price of £1,360 per unit, 24% under the government's figure. The difference lay in commercial enterprise and efficient management. Subsequently this producer has developed and successfully marketed an improved design, furnishing completely equipped and assembled house interiors for installation in masonry foundations and walls erected to his specification by local building contractors.

If government has shown a lack of capacity as promoter and manager of new industrial projects, what can government management accomplish in taking over a going industry with a record of successful and profitable operation under private ownership? The answer to this question is available in the operating balance sheets for the "first round" of nationalization. They reveal a consistent record of inefficiency and financial loss—the measure of mismanagement.



Britain's nationalized railroads carry the nation's freight. They tolerate no compensation from motor trucks or any other form of private transport enterprise.

The two-year deficit (1947 and 1948) of the nationalized coal industry amounted to 86.8 million dollars, as compared with a prewar (1938) profit of 54.4 millions under private ownership and operation. With unification of the industry, 6,000 persons have been added to the administrative, non-productive staff, an increase of 27%. Output per miner has decreased 6.2%. Absenteeism has doubled, and strikes have tripled, as compared with the prewar figures. Net result is that cost of coal at the pithead has gone from $4.02 in 1938 to $11.25 in 1948, an increase of 180%. The once active and profitable export trade in coal has shrunk from 46 million tons shipped abroad in 1938 under private enterprise to 16.2 million tons in 1948, down about two-thirds.

The three-year deficit in civil aviation operations is 120 million dollars, and the estimated deficit for 1949-1950 will add another 15 millions to this figure. The nationalized railroads acknowledge an operating loss of 19 million dollars in 1948, without allowance for depreciation of equipment; the 1949 loss is estimated at nearly three times this amount, and a 16⅔% rise in rail freight rates is imminent to offset this deficit in part in 1950. Cable and wireless operations report a profit of 6.8 million dollars in 1948, but in 1946 (the last year under private operation) the profit figure was 14 million dollars; government management has done not quite half as well as private enterprise.

Government Service

If the monopoly of nationalized industry does not find its justification in efficiency and economy of operation, and if the public interest is indeed the motivating factor, we should find supporting evidence of benefits in this direction. But government ownership and management has proved no boon to the consumer, either domestic or industrial, in respect to availability, quality, or cost of service.

On the contrary, we find electric rates up by 50% since nationalization, installation charges substantially increased, and the rebate system abolished. Commercial and street lighting is substandard and severely curtailed. Power uses are strictly rationed. Complaints are rife, but there is no early relief in sight.

It must be conceded in all fairness, that the problems of rehabilitation and the postwar accumulation of deferred maintenance and expansion programs are not easy. It is

also a fact that substantial new electric generating capacity has been and is being put into operation in various localities. But statistics do not give a satisfactory answer to the situation nor satisfy the individual need. Under the government's planning and administration, a large proportion of the expansion for development and servicing of new areas has been done at the expense of providing even minimum facilities and service for established users. Five years have elapsed since the end of the war, and for three years the government has undertaken to provide the nation with electric power. Yet in the manufacturing districts of London there are scores of small concerns, with 50 workers or less, that are forced to operate inconveniently and uneconomically on a three-shift basis, with two-thirds of their equipment idle, to distribute the power load.

Vanishing from the British scene is contract motor haulage. You can still operate your own trucks to carry your own product, but regardless of convenience or economy, you can't hire a commercial trucking concern for deliveries beyond a 25-mile radius.

And with the government monopoly, having no competitive need or incentive to consider the individual consumer who is the nominal beneficiary of governmental service, there is no recourse. Criticism is freely and vigorously voiced, and demands are made, supported by the evidence of need, but they dissipate in futility. The local managers, who would formerly have moved heaven and earth to correct a situation or satisfy a complaint, no longer have the authority to act. They can only shrug off the customer's petition or mechanically pass it along in the endless and complicated official channels that lead to the oblivion of some distant and impersonal bureau. The personal touch has been lost. The incentive and the opportunity for service, of which satisfaction and progress are compounded, have disappeared.

I talked with the managing director of a company producing central station equipment, a supplier to the nationalized electric power industry. His experience explains in part what is happening, and why the British citizen is not getting the service to which he is entitled. "When we were selling to private dealers and corporations," he said, "we dealt with keen engineers who were eager to give service and insisted on getting service from us. When a thing was needed, they got onto our company immediately. It was their responsibility, and ours, to see that something was done about it, and we both got off the mark quickly. Now, under exactly similar circumstances, we can only fill out papers. Both of us are at the mercy of a doctrinaire who has the power of decision by remote control. A matter that would formerly have been cleared up over night now takes weeks, or it may go by default altogether."

"Labor is even worse off," this businessman added. "It is almost impossible for the workers to get through to a person with authority."

This last comment is significant because it concerns a sector of the public interest that is a first consideration in the social aspect of the laborite program. For in the labor government, labor itself comes under a bureaucracy. In a nationalized industry, that condition is magnified even more.

There is probably no group in the whole British economy for whom more has been done, and whose interests are closer to the government, than the coal miners —the "Bevin Boys" of wartime, when the present Secretary of State was their union leader. One purchasing man who comes from a coal mining family and has a good deal of sympathy for laborite objectives, told me: "Conditions in the mines were really shocking, but the pendulum has swung too far." Yet the record of strikes and unrest in the nationalized coal field operations shows that labor itself, for all its preferential position in the program, is dissatisfied and unhappy about the arrangement.

The users of coal—and this includes practically every citizen and every business—are also unhappy. The domestic consumer registers with a local distributor or coal yard; thenceforth he can look to no other source. Thus the national monopoly is passed along to monopoly at the local and individual level. If he doesn't get along well with the dealer, if the supply is short or the service poor, that's just too bad; but there's nothing he can do about it. He takes whatever quantity and quality may be allotted to him, when available, at the fixed price. Government-mined coal costs him $1.60 per ton more than it did before the government took over. It is small consolation to him that the Coal Board jacked up the export price of coal by $6.50 per ton and practically ruined that business. He still has to keep warm, and it's costing him a lot more to do so.

This situation has its counterpart in industrial coal purchasing. The buyer can accept the principle of quantity allocation, when necessary, even though it involves an unconscionable amount of red tape and paper work, and means "arguing the toss" on production require-

ments every time there is a change in product or in factory methods or in schedules, involving a change in the amount of steam required. He has become inured to higher costs—and his price on coal is three times what it was prewar. But along with allocation and rising prices, he no longer has a choice of mine source; that is determined by the governmental planning agency, and it is frequently in conflict with his own careful selection of a fuel with characteristics best adapted to his company's particular needs and boiler equipment.

There is a general complaint that even on established grades, the quality has greatly deteriorated. One explanation is that facilities for washing and coal preparation are out of balance with mechanized pit operations, so that more dirty coal gets by; the more generally accepted explanation is that a disregard for quality has come with the absence of competition and with an assured market at assured prices under the monopolistic control of a nationalized industry.

There seems to be little hope that this condition will improve. One incident, trivial in itself but perhaps indicative of governmental thinking and policy in its industrial role, suggests that the trend may be toward even more dictatorial methods. The coal broker, who has been retained —thus far—in the distribution system, has been a staunch and aggressive ally of the buyer in the continual battling for adequate quality and delivery. This service is included in his nominal commission of about 4 cents per ton, and most buyers agree that he earns his fee. Last summer, coal buyers were approached by governmental representatives with the proposal that these functions be taken over by the mine selling agencies at a cut rate of 3 cents per ton, thus in effect making the sole supplier the sole arbiter of quality and acceptability and the sole expediter as well, and for a fee. Industrial buyers see in this proposal not only another thinly camouflaged price advance, but the loss of their last weapon against complete arbitary dictation. They have vigorously opposed it; the influential iron and steel industry, a large user of coal, has flatly rejected the plan. But it shows in which direction the trade wind is blowing. If steel is nationalized, the resistance will automatically crumble.

Another nationalized service that affects almost everyone is rail transport. Railroad passenger service under unified governmental operation is on a plane with the "utility models" of merchandise available to the British citizen. It takes you where you want to go, and it brings you back, reasonably on schedule. This in itself is no mean achievement in view of the terrific strain, the wear and tear, experienced by the railroads throughout the war years. A start has been made toward replacing some of the badly worn equipment. One of the suburban lines out of London has been completely re-equipped with clean, comfortable modern coaches, and presumably the others will be improved as time and finances permit. For the present, they range from fair to poor; the need for replacement is obvious even to the railroad administration, but they are doing their functional job. Meals on the dining cars are notoriously the poorest served anywhere in the Kingdom, but they set a national example of conformance to austerity food regulations and they are relatively inexpensive. Meanwhile, fares have been raised and another increase is pending, as in the case of our own railroads.

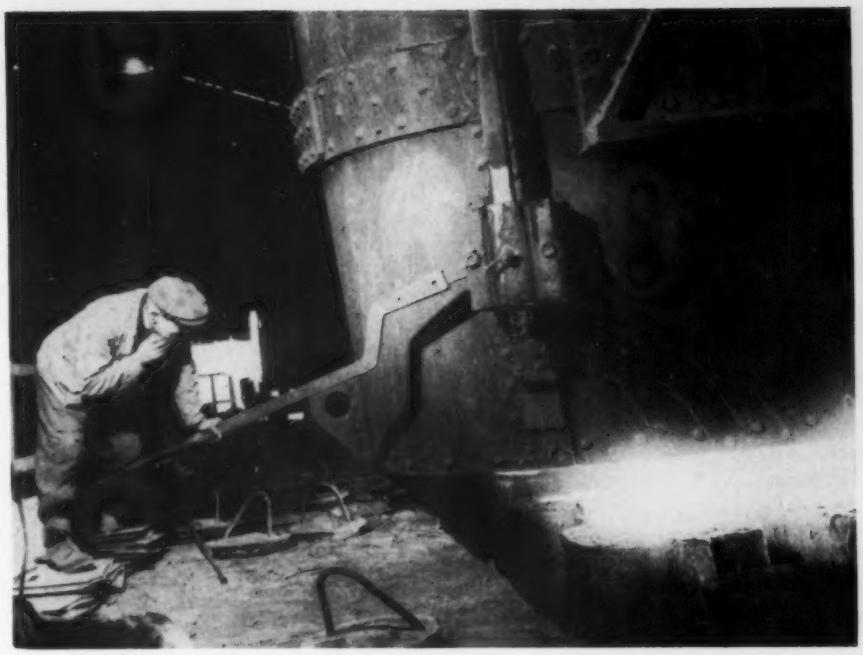
Reference has already been made to the increase in rail freight rates. But industrial transport is a story in itself.

From the standpoint of management and accomplishment, quite aside from any opinions on the ethics, economics or political aspects of governmental ownership and operation of industry, Britain's experience with nationalization indicates that four major results are inevitable.

1. A topheavy administrative expense is incurred, starting with the boards and bureaus in London and extending all the way down to the local level. The governmental structure has been superimposed upon the normal managerial staff of the nationalized industries, without contributing any tangible service to actual operations; there are few cases where the central office activities have replaced or lightened the work of existing administrative offices.

Management by Remote Control

To a large extent, this additional personnel has necessarily been recruited among persons who are unfamiliar with the industry and inexperienced in its affairs. This condition will of course be improved with time and experience, but however conscientiously these duties may be performed, they will always constitute an additional and heavy burden of non-productive overhead, since that is a characteristic of the



Next on the schedule for nationalization is Britain's booming steel industry. Its postwar record under private management: wartime ravages repaired; output at an all-time high, 14% over the best prewar year; 25% of its product going into vitally needed export trade; workers among the highest paid in all British industry, 85% of them on a piecework or production basis; no labor disputes within the industry for more than 50 years.

new positions. Overcentralization entails a mass of additional detail in the way of reports and controls that are in themselves unproductive, and that in turn make administration more cumbersome and less flexible all along the line.

Private enterprise, while eager for growth, inevitably seeks the optimum size for operating and administrative efficiency, and is always ready to adapt its policies and organization for best results in meeting the demands of its field. On the other hand, nationalized industry is inherently committed to the policy of complete centralization, which tends toward rigidity and can meet new situations only through additional regulation.

2. The corollary to this is management by remote control, getting farther and farther away from both the workers and the customers, and making it ncessary to set up elaborate "channels of communication" with the power of decision far removed from any intimate knowledge of specific conditions and requirements.

A manufacturer of coal mining machinery and equipment cited an example of an emergency requirement of 1,000 feet of conveyor belting. He had the material in stock, but while the pit lay idle it was necessary to go through six stages of administrative authority before the requisition reached the proper desk at the Coal Board offices in London for final approval. There was an ironic twist in this incident, in that "safety factors" ranging from 10% to 25% were added at four stages of this tortuous procedure to hedge against a possible cutback, with the result that the supplier eventually received an order for 1,650 feet of belting, a quantity 65% in excess of the actual need. The mine managers are retained in the present set-up, but without having the authority to make decisions they are in a constant state of confusion and frustration.

The sales director of another equipment manufacturer estimated that it takes at least three times as much time and effort in selling to nationalized industry as it does to sell a regular commercial account. "You start at the top," he said, "and have to be very careful not to miss anyone on the way down, lest they become offended and either block or lose the order." It may be noted in passing that under such circumstances, there is no opportunity for an industry to capitalize on the advantages of a competent purchasing department.

3. Being essentially a part of government, nationalized industry makes the economic factors subordinate to political and social objectives. This provides an easy argument to condone lack of efficiency and to discount commercial standards of performance. At the same time, it is a negation of the fundamental reasons for the existence of industry—to provide goods and services efficiently, and to broaden their distribution by offering greater values within the reach of more people.

4. In any form of monopoly, the incentives and the progress of a competitive system disappear. The fruits of monopoly are so numerous and so well known to all businessmen that a detailed recital here would serve no useful purpose. But with the legalized monopoly of nationalized industry, backed by governmental policy and the full authority of the law, these factors are more strangling and dictatorial than ever. Even the citizens of a democratic electorate, theoretically standing in the position of shareholders in the enterprise, have no recourse against either the immediate or the ultimate economic results of the monopolies they helped to create.

Nationalized Transport

But monopoly has its difficulties too. It must be all or nothing, and therein lies one of the great dangers of a creeping, progressive process that threatens eventually to engulf the entire economy. It is not merely a question of nationalizing this or that specific industry; Nationalization must be considered and evaluated as a fundamental principle and policy.

One of the most interesting examples of this is now being worked out in connection with industrial transportation. The railroads were nationalized in 1947. It is not an easy job at best to run a railroad to the satisfaction of the customer. Neither is it easy to run a railroad economically, at a profit; the pattern of consistently rising freight rates in this country is a reflection of the increasing costs and managerial difficulties encountered in the industry. It would not have been surprising to find British shippers and industrial purchasing officers in a critical mood. Yet the answers to repeated questioning on this phase of nationalized industry were uniformly temperate, if not exactly laudatory; rail freight service is taken for granted, and it seems to be reasonably adequate.

This acceptance of nationalized freight service might be explained in part by the fact that, while the railroads themselves have been nationalized, there still exists the alternative choice of over-the-road transportation by motor truck. Britain has a very complete network of excellent hard-surfaced highways —one of the few beneficent legacies of her wartime travail—and wherever you go, there is evidence of active motor transport. Perhaps the force of competition is still alive.

Following through on this line of thought, I sought confirming evidence in actual examples. I visited the fine modern plant of a machine tool builder in Cheshire. It was equipped with a traveling crane that carried the work along to successive work stations on the production line, and running across the far end of the room was an inside spur track, depressed to car-floor level for easy loading. Surprisingly, the entire track area was being used for miscellaneous storage, piled up on the roadbed and effectively blocking any possible entry of a railroad car. My guide explained that they rarely had occasion to use rail transport, preferred "not to entrust our product" to the railroads, and found it more economical and expeditious to carry the finished machines back the length of the room by the traveling crane for loading and shipment on motor trucks. For this purpose, the same factory zone was used where incoming materials (including heavy bedplate castings) are received, also by motor truck.

However, I was quickly disillusioned on the competitive angle. As in most other instances, the government has a number of indirect controls even though actual public ownership and operation have not yet been imposed. To begin with, there are rate controls and taxes. More directly, there is licensing both for the carrier companies and for individual vehicles. Furthermore, there is the very effective weapon of control through gasoline rationing, which determines with unquestionable finality just how far truck transportation is allowed to go.

Licenses and the corresponding gasoline rations come under three classifications, and the regulations are tightening—not altogether for the purpose or with the result of saving motor fuel.

The "A" license covers local haulage and deliveries. It is re-

stricted to distances of not more than 25 miles, and certificates of necessity are required. These certificates are getting harder and harder to obtain. In theory, you can ship goods by truck at your own option up to the 25-mile radius. That limitation in itself rules out most inter-city shipping. In addition, the customer must attest that no other existing means of transport will serve his need, i.e., that it does not conflict or compete with the government-owned railroads and their motor truck auxiliary services.

The "B" license covers contract haulers. It is restricted to service to certain specified destinations and the carrying of certain specified categories of goods. This is the classification that has been most drastically curtailed. Obviously it is the one that competes most directly with the railroads as a private enterprise, and licenses are not granted between terminal points served by the railroads, nor on merchandise that the railroads are equipped to handle. Thus again the sphere of private enterprise is circumscribed, and competition with the government's transport monopoly is not tolerated.

The "C" license covers company-owned vehicles, carrying the company's own products. There is no limitation on the distance to be traveled, and in general the regulations are more liberal, though the gasoline ration does exert a strong restraining influence. In other words, though competition by a transport enterprise as such is disbarred, the customer is not yet forced to patronize the government's service monopoly if he chooses to provide the service for himself, and if he can get the government's permission to do so, and if he does not abuse the "privilege" by going too far.

The transport monopoly philosophy is not new, and it cannot be laid altogether to the account of the present administration. That is one reason why the transition to state monopoly has been so easy and why it is so little questioned. The traditional British reliance on monopoly and control instead of competition has boomeranged. Formerly it worked to the benefit of the railways themselves. Now there is a real question as to whether anyone benefits. Nationalization squarely raises the fundamental issue of what is best for the citizens, whose interests every government purports to serve —the laborite government most loudly of all. This point deserves a more searching examination.

Britain's basic chemical industries are also slated for nationalization. Coal from the nationalized mines is one of the principal raw materials. Its products are used in virtually every industrial field, including the dyestuffs that are essential to the great British textile industry.

Railroads replaced the horse and the canal as the basic means of transportation by reason of the better and more economical service they were able to supply. This was economic progress, and the people benefitted. Following the rule of reason, if a still better mode of transport were subsequently developed, the railroads would in turn be replaced, in whole or in part, in the interest of further progress.

This new competition appeared upon the scene in the 1920s, in the form of motor transport. Meanwhile, the railroads had been subjected to certain controls and legal disabilities to protect the public against actual or possible extortion, which is government's way of dealing with natural monopolies. This gave the railroads an argument for insisting that the rising motor transport system be placed under similar regulation, quite overlooking the fact that if this principle had been applied some decades earlier, the development of the railroad industry itself would never have been possible.

With typical British distaste for competition, the monopoly viewpoint prevailed. In 1930, the Road Traffic Act was passed, limiting the development of road passenger transport and putting a quick end to competition that threatened to provide better service and cheaper fares. The natural corollary to this was that the railroads acquired the road passenger enterprises and again became a monopoly in fact. In 1933, the same principle was applied to "goods traffic" in the Road and Rail Act. It was out of this Act that the "A" license (vehicles for hire) was born, limiting entry to the trade, restricting the scope of service, and keeping up the price to the public regardless of relative costs. Thus a new invention, holding the possibilities of substantial savings and improvements in commercial transportation—possibilities that have been abundantly realized under the competitive system without driving the railroads out of business in those phases of transport for which they are still best adapted—was throttled in Britain from the very outset.

Commenting on this situation, the British economist, F. R. J. Jervis, says (in "Price Control", Hutchinson's Scientific and Technical Publications, London, 1949): "Either the railways had a monopoly, therefore road restriction was unnecessary, or the railways did not have a monopoly, so it was unnecessary to place them (the railways) under the legal disabilities under which they undoubtedly did suffer in meeting a

new competitor. As it was, the consumer obtained the worst of both possible worlds." Under unification and nationalization there is no question but that a monopoly does exist, and the consumer still gets the worst of the deal. Government intervention and control can no longer protect the public, for the government *is* the monopoly. Progress in transport has been halted—another example of the technological and economic stagnation that is characteristic of all monopoly, whether exercised by government or private interests.

Where Do We Go from Here?

State monopoly is on the march in Britain today. It will not be stopped by reasoning, for the four-year record of state ownership is a consistent series of danger signals but the order from headquarters is still "Full speed ahead". It will be stopped only by a change in the government, a return to a political philosophy which can conceive and concede that some agencies other than an all-powerful state may possibly serve the people's interest as well.

The course of the nationalization program, if not the actual time-table, has already been charted. Steel is the next industry to be engulfed; that has already been voted, and is scheduled for 1950. The steel industry in Britain has an excellent record in both wartime and peacetime accomplishment for the national good. It is a basic industry, of course, but the chief claim of "public interest" must rest on the number of people it employs. There is a strong suspicion that this is the principal objective of nationalization—to put another half-million workers on the government's payroll and making them economically dependent on the state. There would be, too, the leverage upon the steel-using industries, a factor nearly as important and far-reaching as control of fuel and transport. There is no reason to believe that state management of the steel industry would be any more successful than in any of the other enterprises where it has been tried and found wanting.

Nationalization of the insurance companies would bring large financial resources under state control. What would it do for—or to—the insurance business, which is currently one of Britain's important "invisible exports"? It is a fairly safe prediction that foreign commerce in this field would go the way of the coal export trade, for it does not seem sensible to place one's financial security in the hands of an alien government. Would you?

Other industries that are on the nationalization agenda—particularly cement—are said to be divorcing their foreign operations from the parent companies in Britain as quickly and as quietly as possible, to avoid losing all.

Where will it end? Some of the planners in the British labor government have been quite frank on this point. The ultimate objective, and a perfectly logical conclusion too, is nationalization of the land, which would give government the power to dictate the use to which any property could be put. This final power is essential, they say, to complete realization of state planning and control, and to enforcement of the present piecemeal nationalization program. Stated thus baldly, the proposal is appalling. But the idea is not as fantastic as it sounds when you consider the nationalization of industries that has already taken place, plus the powers already vested in the Town and Country Planning Board, plus the existing authority (so far, little used and rarely mentioned) for "labor direction", that can uproot a worker and assign him to tasks and to a way of life that may be far from his own selection.

We may comfort ourselves with the complacent assumption that "it can't happen here". But we have already accepted government dictation of what and how much the farmer is permitted to raise on "his" acres, softening the decree with lavish subsidies from the public treasury. The location of industrial plants at government behest, first for security and latterly for social-economic reasons, is another step in this direction. Complacency is our most dangerous national disease.

Whether it is considered as an end in itself or as the means to other social or political ends, nationalization of land use is the antithesis of democracy. It spells the supremacy of the state and an end to the rights of the individual—engulfing not only the private property owner, but labor itself, under whose standard this program is being carried forward.

Time for Action

The recent elections in Australia and New Zealand, where nationalization of industry has also been tried and found wanting, and has been repudiated at the polls, suggests that the march of state monopoly among the English speaking nations, at least, will be stopped short of that extreme. Their experience tells us, too, that it is far easier to nationalize an industry than to denationalize it and return it to private ownership and competitive management. The sober statements of the conservative leaders who have taken up the reins again in the island governments indicate that they are none too sanguine of their ability to retrace the steps that have already been taken; it may take years. While it is a comparatively simple procedure to rescind a regulation or to alter a policy, the problem becomes more difficult when a change in ownership is involved, and particularly if assets have been depreciated, markets lost, and new labor contracts put into effect. With denationalization, the accumulated debits of mismanagement will come home to the state, and the bill may be a staggering one. The time to stop such developments is before they start.

Other Solution Must Be Found

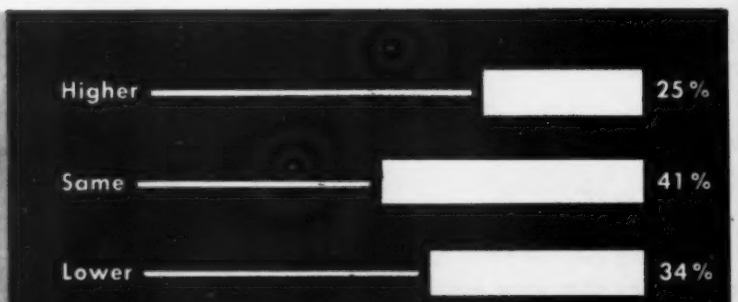
We in America are fortunate in that there is still time to work out a solution other than state monopoly. We need not accept it as an inexorable world trend. We are fortunate in that the factors of our problem are different and favorable, with a wealth of natural resources and productive plant, with a high and rising standard of living, and, above all, with the spirit of enterprise and the incentive of individual opportunity. We are fortunate in having the examples of socialist and state experimentation to guide and warn us if we will but heed them.

We shall do well to watch all of these developments closely, that we may recognize the seeds of state monopoly for what they really are, and that we may not be drawn too far along a path from which there is no return. And those seeds are present in our economy. They will flourish in a climate of greed, ambition for power, laziness, reliance on government, or doctrinaire dictation. They can be stamped out, but not by regarding the state as a protector of private privilege, nor by identifying labor and the state, nor by setting one group against the other. We need enlightened leadership for the development of a well rounded social consciousness and an appreciation of our new international responsibilities. And we must work together—government, labor, and capital, all three—to build and maintain an economy in which each will play its proper role and in which all may prosper.

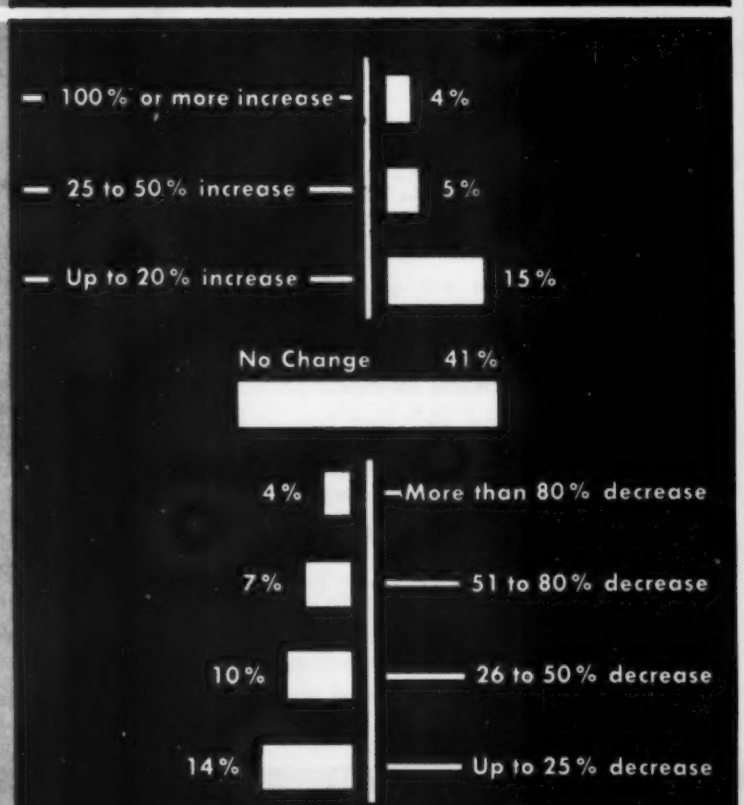
What Is the Outlook for CAPITAL GOODS?

One of the most important basic indicators of trends in the nation's economy is the capital goods market. Although the Department of Commerce and the Securities Exchange Commission estimate that there will be a drop of 14% during the first quarter of 1950, as compared with the same period last year, there have been some recent indications of an upswing in capital goods orders. In this survey, we have tried to determine the extent and significance of current and planned capital goods expenditures.

1 Are capital goods purchases planned by your company for 1950 higher, about the same or lower than in 1949 ?



2 What is the estimated overall percentage change ?



3 Do current or planned capital goods expenditures represent normal replacement, or needs that were deferred by uncertainty in 1949, or new expansion programs*

*Some respondents named more than one choice on this question, so percentage factors total more than 100

4 Are you experiencing any shortages, extended delivery dates, or serious price rises on capital goods orders

80% of respondents reported that they were experiencing no shortages, extended delivery dates or serious price rises.

Long delivery was reported by others on heavy machinery, steel and steel products, specialized equipment, boilers, some paper and paper products, office machinery, and aluminum foil. Price rises up to 15% were reported on some capital goods, and several others mentioned price rises in steel.

5 If capital goods purchases are being deferred or cut back, what are the principal reasons

Principal reasons, listed in order of frequency: expansion and replacement programs completed; lack of business or lower sales; uncertainty about future business; general economic uncertainty; lower profits and lack of funds.

6 Would a reduction in corporation or excise taxes stimulate increased capital goods purchases by your company

WHAT THEY SAY

"Political acts toward business taxes and business outlook in general will govern extent of further modernization."

"We plan our purchases on capital goods as needed for economical operation and buy when needed. Occasionally such expenditures are when things are blackest and new machinery might save us money in production and make us more competitive."

"Higher costs demand better machine tools".

"Believe excise taxes are affecting consumer demand for our product. We have definite plans for expansion which would be put into process if our sales increased substantially."

"With a huge government budget to balance, the current administration is once again casting envious glances at corporation profits. As a result, the uncertainty over what the tax program holds for business is exerting a deterrent influence on capital goods expenditures."

"In almost all reports it is indicated that the first half of 1950 will show great activity. Is it not reasonable to ask that if this is the general opinion why should everyone run at full speed and be caught the last half of the year?"

"PUBLIC RELATIONS" is Everybody's Business

● *By R. N. Patrick*

THE concept of "The public be damned" as a way of doing business is today as obsolete as the era of the dinosaurs. Nowadays the least breath of unfavorable publicity is enough to inflict on management nightmares of Congressional investigating committees, anti-trust suits, and labor difficulties. Times have changed, and companies that are slow to adjust are headed for trouble, and no mistake.

Public opinion forms gradually over a period of time, and if it is unfavorable a belated effort to change it is enormously expensive. The full page advertisements of the chain stores that are now behind the monopoly eight ball might serve as examples of hasty fence mending in the field of public relations.

The chaotic conditions of the war years gave great impetus to the development of public relations work. A good many purchasing agents who had never before been aware of the importance of good public relations had the hard facts demonstrated to them in no uncertain terms as they saw companies that had neglected their business contacts by-passed on scarce and hard-to-get items. If there was any choice after the rationing on priorities, the materials went to the companies that had built up reputations for honesty, fairness, friendliness, and courtesy. It is to be hoped that the necessity

R. N. Patrick is Purchasing Agent of the Plantation Pipe Line Company, Atlanta, Georgia, and is currently serving as Vice President of the National Association of Purchasing Agents for District No. 7. In that capacity, he represents on the Executive Committee the rapidly growing industrial area of the southeastern states, including the Alabama, Chattanooga, East Tennessee, Florida, Georgia, Louisville, Memphis, Mississippi, and New Orleans Associations.

A native of Newton County, Georgia, he attended public schools at Mansfield and studied architecture for two years at Georgia Institute of Technology, working his way through college by doubling as parts and accessory salesman for the Atlanta branch of Cadillac Motor Company. He took time out at the end of the second year for an extended trip to Europe. On his return, he went to work in Washington, D. C., and resumed his studies at George Washington University, School of Business Administration.

In 1929, the automotive industry again claimed his services and he added a third university to his educational record. He took a position in the accounting department of the Packard Motor Car Company and enrolled in the Business Administration School of the University of Detroit. There was a brief interlude with the Coca Cola Company at Flint, Michigan, and in 1932 he was back in Detroit, in the accounting department of the Chevrolet Division of General Motors Corporation. Four years later, he was transferred to Chevrolet's Atlanta plant as head of the cost accounting department.

Mr. Patrick's purchasing experience dates back to 1942, when he joined the newly organized Plantation Pipe Line Company as Purchasing Agent. His indoctrination was a highly concentrated process of on-the-job training, for the company promptly found itself in a wartime expansion program. His cost accounting and sales experience stood him in good stead, as did his work in the automotive field, for his new responsibilities included supervision of the company's extensive motor car fleet. He is also active on the Safety Committee of the company.

He had a leading part in the formation of the Purchasing Agents Association of Georgia in 1944, and was chosen as first president of that organization, subsequently serving two terms as National Director and heading important committees, including program and membership. His selection for national office last spring was a logical sequel and a popular choice.

Mr. Patrick is married and has two sons and one daughter. He is an ardent hunter and fisherman, and scores in the upper 90s on the golf course. He is a member of the Atlanta Chamber of Commerce, Lions Club, and the Masonic fraternity.

for priority purchasing may never arise again, but our bitter experiences during the war showed us clearly the connection between purchasing and public relations work. It was a lesson to remember.

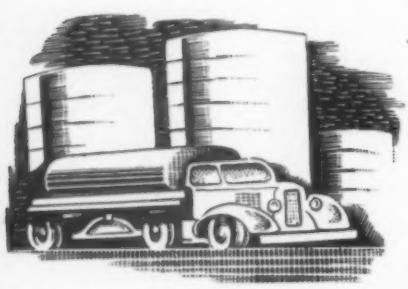
Since the war there has been a growing awareness of the necessity for effective public relations work. A new profession is evolving, that of the public relations counsel. Since it is still in a beginning stage, it would be well, before discussing further the purchasing agent and his contribution to good public relations, to set forth the aims of a public relations department.

First of all, let me emphasize that good public relations work is much more than getting publicity for a company. It is closely tied in with advertising, yet it entails more than advertising. It is possible for a company to make and sell a product which has the respect of the public, and at the same time fail to command public respect for the company as an organization. The primary goal of public relations work, as stated by Earl Newsom, general counsel for public relations for the Standard Oil Company of New Jersey, is "to develop in the public mind a favorable image of the company."

Mr. Newsom lists the three fundamental duties of a public relations department as:

1. Helping management to understand the rapidly increasing importance of public opinion as a practical business consideration.

2. Speaking with authority on public relations to actions by management; to suggest actions that will gain respect and confidence.



3. Establishing and maintaining adequate communications between the management we serve and the large groups of people important to them.

With the first two of these public relations functions, we as purchasing agents have little direct concern. When you consider that in spite of polls and statistics, even the most experienced do not fully know why people think as they do, how they acquire their opinions, nor to what extent their convictions can be changed, perhaps we had better be thankful that our specific function and responsibility is in more tangible fields — hunting the best buys, and seeing to it that the quality, price, and delivery are satisfactory.

However, with the third public relations activity we do have a concern—and an important one. The purchasing agent should not only buy, to the best of his ability, the right materials at the right prices at the right time; he must also recognize that it is his responsibility to see that through his purchasing operations his company enjoys public good will.

Every purchasing agent, through his contacts with suppliers and their representatives, has an opportunity to do a public relations job along with his buying. In some types of companies and institutions, a large proportion of the contacts with the public will come through his office. In other companies maintaining large and active sales and service staffs, the public contacts in purchasing may be relatively limited in comparison. Nevertheless, the opportunity exists and the company will be judged by how the purchasing activities are handled.

Whatever the case, there is one aspect of public relations work that concerns us all—namely, our relations with our own company personnel. A company cannot very well command public respect unless it commands the respect of the people who work for it. We should do all in our power to further good employee relations. If the employees enjoy security, respect top management, and consider their working conditions fair and satisfactory, then the company will have the reputation of being a good concern to work for. That is a fundamental need in developing the favorable image of the company in the public mind.

To strive intelligently and consistently for good public relations, a corporation should have a standard or goal, from which a code of policies and conduct could be derived. It seems to me that the following points should be included:

The organization should be open, friendly, and communicative.

The company would consider the public interest in framing its policies and arriving at its decisions.

It would be a good employer, thereby having not *one* public relations officer, but *every* employee selling the company all the time.

Within the scope of its business, it would contribute importantly to the strength and well being of the nation.

It would be alert to—and willingly assume—its responsibilities as a good citizen of the community.

It would consider the benefits of widely distributed stock ownership, as a means of fostering interest and better understanding.

It would endeavor at all times to keep its policies sound and its earnings reasonable.

Finally, it would be highly and honestly competitive.

Let me point out here that educating the public is not as easy as it sounds. You can trot out huge stacks of charts and graphs, and quote statistics by the hour, but people are not going to pause very long to listen. In our high pressure age, people in general don't have well founded opinions, and they can't be expected to. For the most part, they receive impressions, and impressions sometimes come from trivial details or from the most unexpected sources. Because of this, every employee—everyone connected with the company in any capacity—is in reality a public relations worker, whether for good or bad.

Purchasing agents, with their wide and varied contacts, are in a key position. Let us keep this in mind and work for good public relations for our respective companies.

There are public relations to be considered, too, and to be developed and maintained, in respect to our Association and our profession of purchasing. Again, the impressions which those outside the buying ranks may hold about purchasing are largely in our own hands, for better or worse. And we, as members of the purchasing profession, are either the beneficiaries or the victims of the public opinions thus formed. It is a part of our duty to the Association and to ourselves "to develop in the public mind a favorable image of purchasing".

One of my assignments on the Executive Committee of the N.A.P.A. this year is to serve on the National Committee on Public Relations. It is a challenging assignment, and one that holds a world of opportunity. But, just as in the company, the favorable results depend on each and every member May I urge full support and cooperation in this work, that we may all benefit to the fullest degree in the services offered by the National Association.

Graphic Records in Receiving Inspection

Statistical techniques applied to inspection of purchased materials

Analysis shows quality pattern of dimensional accuracy or other critical factors

Corrective action can be directed to better conformance with purchase specifications

By W. A. MacCrehan, Jr.
Professor, Administrative Engineering
New York University

THE conversion of raw stock into a finished product with a minimum of loss has been a problem faced by man from the period of assembling the pyramids to the present era of mechanized precision manufacturing. There is a balance point between the cost of producing the product and the cost of inspecting the product as a guarantee of specification conformance. That balance point varies from product to product and from plant to plant, yet through the intangibles of operating conditions there exists a common ingredient that can be controlled, namely, incoming raw material.

The condition of the raw material can generally be considered under two categories of inquiry:

a. The question of whether the original specification is truly designed to meet the functional needs of the item purchased.

b. The question of the degree of variation encountered in the product as purchased and delivered to a given specification.

The first requirement is to a large degree determined by the caliber of the engineer who establishes the original specification. A realistic knowledge of the exact capabilities of the manufacturing processes is a fundamental requirement in this phase of production planning.

The second condition comes within the province of purchasing and receiving inspection. It can be controlled with relative ease by the employment of statistical quality control procedures, directed toward such corrective action as may be indicated. The problem of dealing with the vendor on corrective action in his production methods again resolves itself into two categories:

1. The vendor who knows nothing of statistical calculation.

2. The vendor who employs statistical quality control techniques.

In dealing with the non-statistically minded vendor, we must find some industrial Esperanto that will transmit our inspection information on the measured product to the vendor in simple, clear, understandable terms. The medium suggested to accomplish this task is the "histogram"—a graphic record of the inspection report. It has been used with notable success by the Hunter Spring Company of Lansdale, Pa.

The histogram is constructed by plotting the actual results of inspection of a representative sample lot, as indicated in Figure 1. The numerical count of pieces falling within each gradation of gage is projected in bar chart form as shown at the right. In this example, a lot of

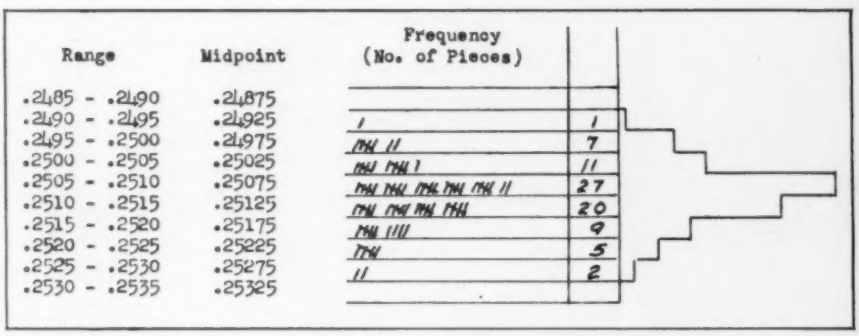
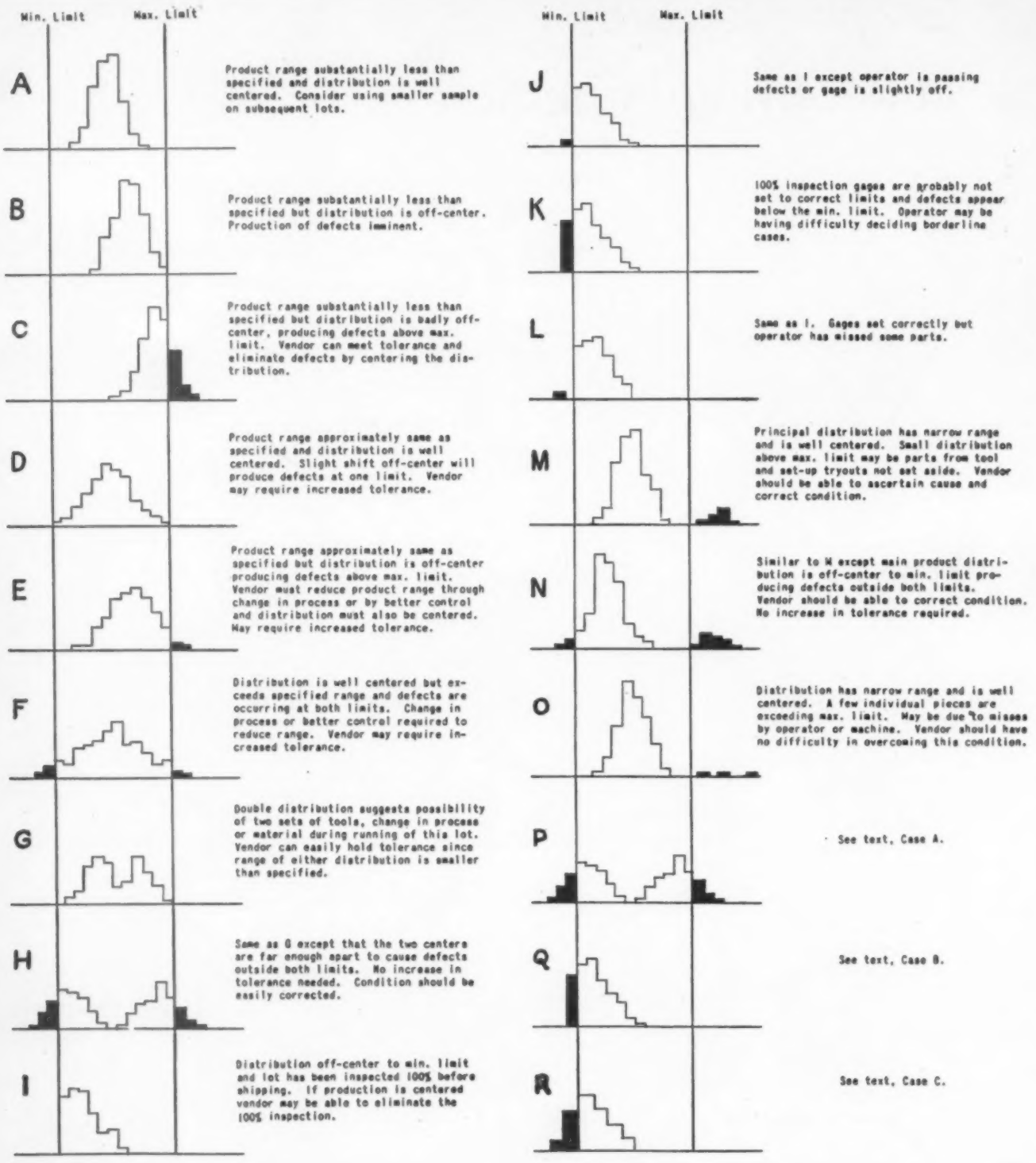


FIGURE 1.

TABLE SA-1.0
AVERAGE OUTGOING QUALITY LIMIT = 1.0%

Process Average %	0-.02			.03-.20			.21-.40			.41-.60			.61-.80			.81-1.00		
Lot Size	n	c	p_t%	n	c	p_t%	n	c	p_t%	n	c	p_t%	n	c	p_t%	n	c	p_t%
1-25	All	0	-	All	0	-	All	0	-	All	0	-	All	0	-	All	0	-
26-50	22	0	7.7	22	0	7.7	22	0	7.7	22	0	7.7	22	0	7.7	22	0	7.7
51-100	27	0	7.1	27	0	7.1	27	0	7.1	27	0	7.1	27	0	7.1	27	0	7.1
101-200	32	0	6.4	32	0	6.4	32	0	6.4	32	0	6.4	32	0	6.4	32	0	6.4
201-300	33	0	6.3	33	0	6.3	33	0	6.3	33	0	6.3	33	0	6.3	65	1	5.0
301-400	34	0	6.1	34	0	6.1	34	0	6.1	70	1	4.6	70	1	4.6	70	1	4.6
401-500	35	0	6.1	35	0	6.1	35	0	6.1	70	1	4.7	70	1	4.7	70	1	4.7
501-600	35	0	6.1	35	0	6.1	75	1	4.4	75	1	4.4	75	1	4.4	75	1	4.4
601-800	35	0	6.2	35	0	6.2	75	1	4.4	75	1	4.4	75	1	4.4	120	2	4.2
801-1000	35	0	6.3	35	0	6.3	80	1	4.4	80	1	4.4	120	2	4.3	120	2	4.3
1001-2000	36	0	6.2	80	1	4.5	80	1	4.5	130	2	4.0	130	2	4.0	180	3	3.7
2001-3000	36	0	6.2	80	1	4.6	80	1	4.6	130	2	4.0	185	3	3.6	235	4	3.3
3001-4000	36	0	6.2	80	1	4.7	135	2	3.9	135	2	3.9	185	3	3.6	295	5	3.1
4001-5000	36	0	6.2	85	1	4.6	135	2	3.9	190	3	3.5	245	4	3.2	300	5	3.1
5001-7000	37	0	6.1	85	1	4.6	135	2	3.9	190	3	3.5	305	5	3.0	420	7	2.8
7001-10,000	37	0	6.2	85	1	4.6	135	2	3.9	245	4	3.2	310	5	3.0	430	7	2.7
10,001-20,000	85	1	4.6	135	2	3.9	195	3	3.4	250	4	3.2	435	7	2.7	635	10	2.4
20,001-50,000	85	1	4.6	135	2	3.9	255	4	3.1	380	6	2.8	575	9	2.5	990	15	2.1
50,001-100,000	85	1	4.6	135	2	3.9	255	4	3.1	445	7	2.6	790	12	2.3	1520	22	1.9


Min. Limit
Max. Limit
A
Product range substantially less than specified and distribution is well centered. Consider using smaller sample on subsequent lots.
B
Product range substantially less than specified but distribution is off-center. Production of defects imminent.
C
Product range substantially less than specified but distribution is badly off-center, producing defects above max. limit. Vendor can meet tolerance and eliminate defects by centering the distribution.
D
Product range approximately same as specified and distribution is well centered. Slight shift off-center will produce defects at one limit. Vendor may require increased tolerance.
E
Product range approximately same as specified but distribution is off-center producing defects above max. limit. Vendor must reduce product range through change in process or by better control and distribution must also be centered. May require increased tolerance.
F
Distribution is well centered but exceeds specified range and defects are occurring at both limits. Change in process or better control required to reduce range. Vendor may require increased tolerance.
G
Double distribution suggests possibility of two sets of tools, change in process or material during running of this lot. Vendor can easily hold tolerance since range of either distribution is smaller than specified.
H
Same as G except that the two centers are far enough apart to cause defects outside both limits. No increase in tolerance needed. Condition should be easily corrected.
I
Distribution off-center to min. limit and lot has been inspected 100% before shipping. If production is centered vendor may be able to eliminate the 100% inspection.
Min. Limit
Max. Limit
J
Same as I except operator is passing defects or gage is slightly off.
K
100% inspection gages are probably not set to correct limits and defects appear below the min. limit. Operator may be having difficulty deciding borderline cases.
L
Same as I. Gages set correctly but operator has missed some parts.
M
Principal distribution has narrow range and is well centered. Small distribution above max. limit may be parts from tool and set-up tryouts not set aside. Vendor should be able to ascertain cause and correct condition.
N
Similar to M except main product distribution is off-center to min. limit producing defects outside both limits. Vendor should be able to correct condition. No increase in tolerance required.
O
Distribution has narrow range and is well centered. A few individual pieces are exceeding max. limit. May be due to misses by operator or machine. Vendor should have no difficulty in overcoming this condition.
P
See text, Case A.
Q
See text, Case B.
R
See text, Case C.

82 pieces has been inspected and plotted.

The question of what size of sample should be taken, short of 100% inspection of the entire lot, can best be determined in two stages: (1) the experience of knowing the risk that may be tolerated of accepting imperfect material, and (2) the economics of the value of guaranteeing product conformance vs. the cost of inspecting the material. As a general suggestion, the Dodge-Romig Single-Sampling 1% Risk table, using a process average of 1%, has proved practicable and successful. This allows all the protection of a sampling plan on the rejection of lots of poor quality, plus yielding a process pattern picture on accepted lots of good quality. The table is shown herewith.

The graph obtained from Figure 1 is set up in relation to the permissible minimum and maximum limits for the particular product or part. A variety of such graphs are shown herewith, with a brief interpretation of each. They illustrate with startling clarity the tendency of distribution toward a pattern that can be recognized. On recognition, a corrective action can be instigated.

Let us take three typical factory problems to show these charts in operation.

Case A. The purchasing agent of a midwestern steel firm received a measurement report from the receiving inspection department on material being supplied by a new firm that had underbid the previous supplier. The histogram appears as "P" in the chart series. From observation one can judge that the new supplier can meet the specification requirements, but that his process is not in control in that two distinct sets of operating conditions are present.

Case B. The chief inspector of a farm implement company reviews the receiving inspection report on the brake horsepower of a two-cylinder gasoline motor (Histogram Q). He can see that the test gages at the vendor's factory are not conforming to test gages in his own factory, erring on the minimum side. Through a check of the gage equipment, reliability is ascertained and a corrective report can then be sent to the vendor.

Case C. A small chemical plant has been supplying a city with chlorine for water purification. Chemical analysis of the chlorine is necessary to determine whether the chlorine meets a minimum concentration value. The receiving inspection department draws representative samples from the lot and plots the concentration values (Histogram R). When reviewed by the chief chemist, he notes that the distribution of the values indicate improper location of the process, resulting in a high percentage of non-conformance of the product.

Getting Corrective Action

The object of this analysis, of course, is not merely to determine whether shipments are to be accepted or rejected, but to encourage and direct corrective action in the supplier's production methods and control to assure delivery of acceptable products. The question of how to convince the vendor of the reliability of your report must be done at the time that the initial contract is granted. A prime requirement is to establish a common inspection procedure, using common gages under similar operating conditions. Where this standardization exists between the supplier and the purchaser, a common language of industrial interpretation exists; where it does not, misunderstandings are the rule rather than the exception.

An excellent example of forward vision and good inspection planning is found in the "QR" (Quality Report) form used by Hunter Spring Co. This consists of a manila tag attached to and sent along with each shipment of material to their customers. On one side of this tag is Hunter's own inspection report, with the graph showing the representative pattern of how this particular lot of material measured to Hunter inspectors. This pattern can be readily plotted against the reports of the customer's inspectors. In many cases, customers rely on the

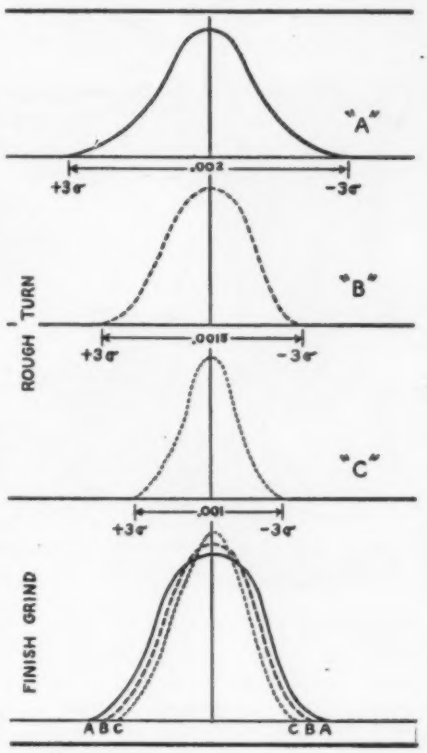


FIGURE II.

"QR" as documentary evidence and have eliminated the cost of incoming inspection entirely.

At this point it might be wise to stop and reflect on the basic merit of the plan—whether the additional efforts to insure conformance of the raw stock to specifications as established on the purchase contract are worth the managerial effort involved. Past experience yields evidence that the insurance of quality conformance at the point of raw stock purchase has a far reaching effect on subsequent operations, as the raw stock is converted into a finished product. A typical case history points out the tangible factors when the process is treated in a statistical manner.

This instance comes from a midwestern manufacturer of fractional horse-power motors. An essential part of the electrical unit is the manufacture of a 14" rotor shaft; critical points are the bearing seats and overall dimensions. The sequence of factory operations is: cut-off, center, rough turn, rough grind, harden, finish grind. A careful dimensional check was made on 75 shafts at the rough turn operation, the distribution was calculated statistically, and the resulting curve labeled "A". Similar data was taken and calculated on 75 different shafts to form the curve "B", and on a third lot "C". The normal process of manufacturing allowed a machine setting of the "specification point". Thus a common mean could be validly assumed, and the three curves plotted to a common axis.

These shafts were carefully placed in marked racks for identification, though unknown to the operator to insure the removal of any bias in subsequent operations. When the finish grinding operation was complete, a similar statistical distribution was made. The results of this test, shown in Figure 2, indicate conclusively that the pattern of "what goes in" clearly affects the pattern of "what comes out". To make sure that these results were not merely a chance occurrence, six similar tests were conducted on other lots; each of the six tests confirmed the original results.

Better Quality at Lower Cost

The management of an industrial plant today is faced with the constant problem of producing a better quality product at a lower manufacturing cost to offset rising material and labor expenses. From a practical viewpoint, the inspection of incoming material may be considered most efficient when it can be eliminated. However, before elimination, an assurance of security must exist that the product being received conforms to the purchasing specifications.

Education of the vendor to high quality standards is not a chance condition; it must be planned. It is sound logic—the "ounce of prevention"—that money spent to achieve quality consciousness on the part of vendors will hasten the day when the Quality Report will provide the necessary insurance to minimize incoming inspection to a negligible expense. Statistical methods of quality of control provide the key. It needs only the intelligent cooperation of manufacturers and purchasers to use this key to improve quality in purchased material and manufactured product.

Coordination for Control of

By Fred M. Burt

●

Department heads are consulted and notified on product changes affecting their work

How engineering change notices are handled within the organization

Purchasing agent is responsible for parts made by outside manufacturers

THE General Controls Company, Glendale, Cal., produces an extensive and comprehensive line of industrial and commercial control instruments, embracing scores of standard and special units for the automatic regulation of pressure, temperature, and flow volume. These devices are made up of an almost infinite variety of small precision parts produced in its own plant. There may be an element of poetic justice in the inevitable corollary that its own procurement and manufacturing operations must be organized under a strict and well coordinated system of working controls to insure smooth and efficient production and to avoid the headaches and complications that would otherwise ensue.

To give an idea of the scope of this company's operations, some basic facts are helpful. There are six buildings, with a total of 135,600 sq. ft. of floor space. The largest of these is the manufacturing and assembly building, with 60,000 sq. ft.; it houses the production departments, well equipped with automatics and a complete range of standard and special machine tools, in-process storage, inspection, several parallel assembly lines, packaging, and finished parts storage. Other buildings house the power plant, plating, painting, heat treat, sand blasting, scrap recovery, receiving and raw material, storage and shipping, tool design, model shop, research laboratory, engineering, library, and administrative offices.

In process at all times are tens of thousands of parts, large and small, made of a wide variety of metals and alloys, and calling for the whole gamut of machining operations and other processes as indicated in the preceding paragraph. These thousands of parts, manufactured for assembly into the dozens of standard and special control units, require a broad range of raw materials — stainless steel and many other steel alloys, tool steel, sheet steel, copper, bronze, brass, aluminum — in the shape of rods, coils, strips, extrusions, tubing, etc. Purchased parts include sand castings, die and permanent mold precision castings of steel, iron, aluminum, brass, and zinc.

Purchasing Agent Marvin J. Kouf, with his secretary, Treva Carr. Purchase record for more than 5,000 parts is kept in the rotary Cardineer file at left.

Sitting right in the middle of these complex requirements, Purchasing Agent Marvin J. Kouf has responsibilities that go considerably beyond those of a straight procurement job. His duties add up to a real job of procurement engineering. The liaison function is heavily involved, with major problems of coordination between engineering, production control, inventory control, manufacturing operations, and management, as they affect the procurement and flow of materials.

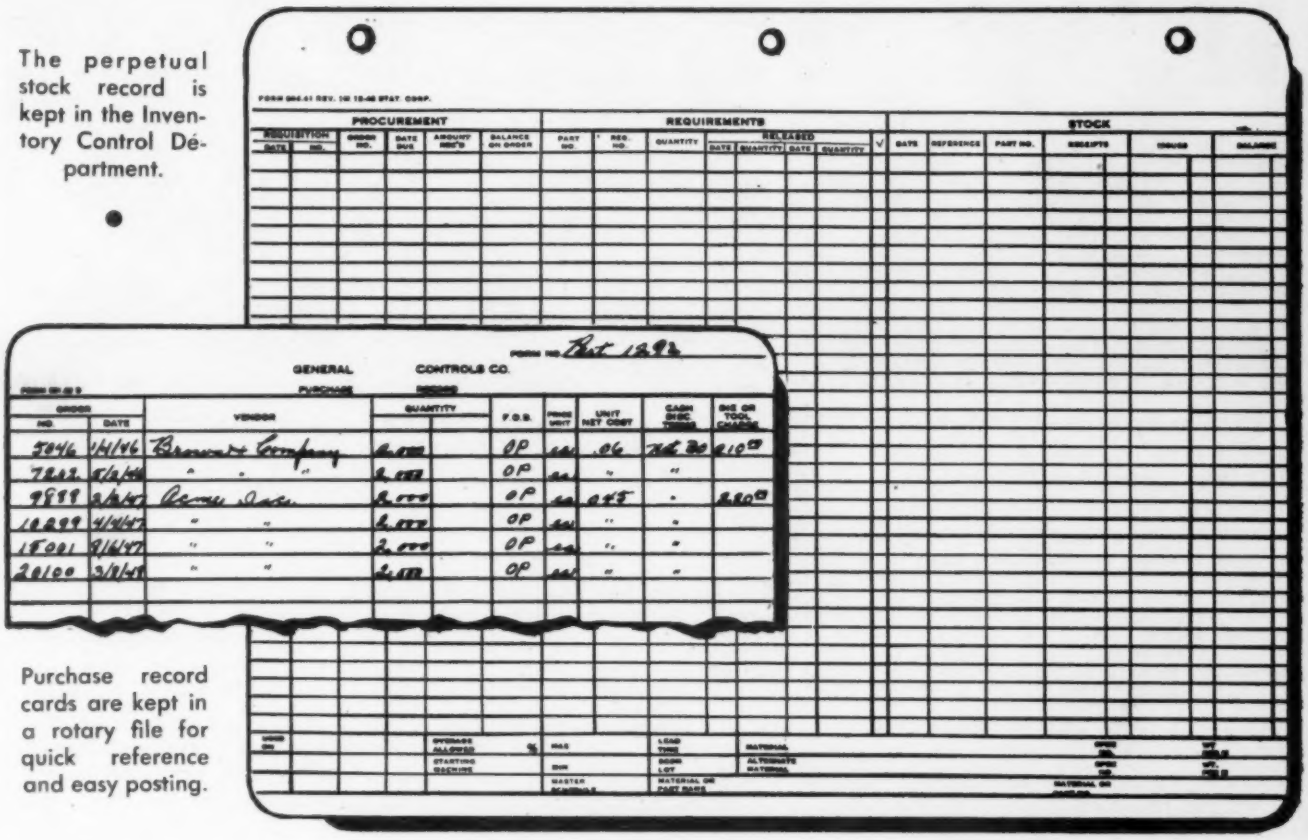
Much of the buying is, of course, the routine purchase of standard materials and parts that go to make up the basic inventory. Under the supervision of Production Control Manager E. I. Harmer, perpetual inventory cards are kept up-to-date for each item of such stock, and a physical inventory is taken once a year. Whenever the stock on hand reaches a predetermined and set minimum quantity, requisitions are sent to the purchasing department to instigate the issuance of purchase orders. Other items, carried in stock for less frequent requirements or for a specific use, have their own special method of handling suited to the circumstances and the need.

Frequently, however, there are changes in design and specification. These changes are primarily a function of engineering. Nevertheless, it is a purchasing department responsibility to make the procurements conform to the new specifications. Consequently there is a distinct purchasing interest involved, and in these cases Mr. Kouf is frequently called upon to assist the engineering personnel in these matters of design and specification with advice as to the availability of proposed new materials and components.

Such changes, or the addition of new products to the line, may be originated by advices from the sales

Engineering—Purchasing—Production

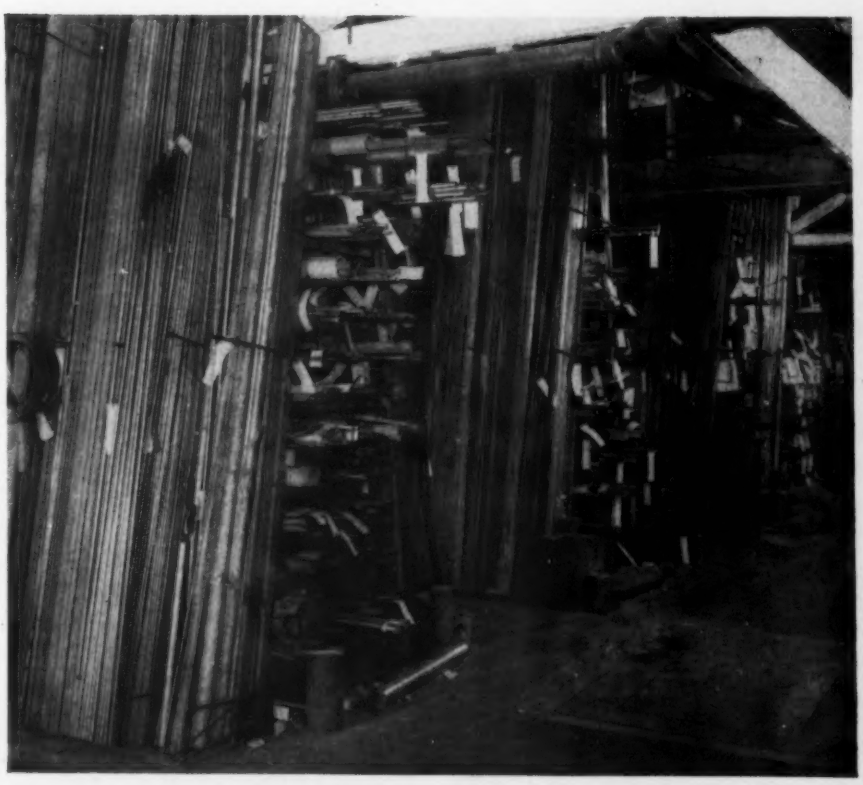
The perpetual stock record is kept in the Inventory Control Department.



Purchase record cards are kept in a rotary file for quick reference and easy posting.

department as to changing or new customer requirements, or the possibility of enlarging the field of sales. Or changes may come from the engineering department through development and adoption of new manufacturing procedures that will make for greater economy or larger production; or through the advisability of using a new material or making a new part, or through some factor of better quality control that will more efficiently produce the same or a better end product. Or the change may be initiated by the purchasing department itself, due to new information regarding materials or purchased parts, supply or delivery or cost situations, or as the result of suggestions from vendors.

When the sales engineers have special problems of control design or performance to be met, to further their sales and to render better service to customers, the problem is referred to engineering. Each case is assigned to a project engineer. In this group there are experts specializing in industrial, aircraft, and



Section of the raw material stock room.

Typical end product of purchasing-engineering cooperation and analysis is equipment such as this Swiss jig borer, selected for its high capacity and extreme precision in die making and duplicating.

Drill press section of machine shop. The purchasing program is closely integrated with production control schedules on a wide variety of manufactured parts.

domestic controls—the three major product groups. Electrical and research engineers, also specialists in their respective fields, work with the project engineers as required. Sometimes the problem involves coordination and cooperation of all these factors. President William A. Ray, who also has the title and responsibility of Chief Engineer for the company, keeps in close touch with all major projects and makes the important final decisions.

As these men work out the details of design and changes, Mr. Kouf is always advised and often consulted in respect to the specific changes to be made before the standard is set in the product specification and before it becomes a purchasing standard. In a typical recent instance, 24 ST aluminum was originally specified as the raw material for a part, but at Mr. Kouf's recommendation this was changed to 11 ST because it would not detract from the appearance or quality of the part, but would offer other definite advantages—it would machine more easily, it is a cheaper alloy, and better outside production costs could be obtained on screw machine work.

There are drawings for every unit—in its primary state and on up to completion; every component part has a number coded to the numbering of the completed unit. Any engineering changes made and adopted are indicated directly on the tracing, listed numerically as No. 1 change, No. 2 change, etc., and described. It may be marked as a revision from one dimension to another, or from one metal or alloy to another. If the change cannot be indicated by such additions or deletions on the tracing, a new drawing is made showing the revised standards.

An "Engineering Change Notice" on each change or revision is sent to all departments that may be affected—production control, master mechanic, inspection, standards, purchasing, sales, bill of materials, sales promotion, and engineering. The department head may then request a revised drawing which carries all production information. Through receiving all these engineering change notices, and being frequently consulted before the changes are made, Mr. Kouf is kept well informed on everything that is going on regarding material and parts requirements and maintains a close relationship both with engineering and with production control.

In the purchasing department there are individual Cardineer record cards for each of more than five thousand parts. When purchasing receives a change notice, the proper card is checked to see how this change might affect procurement, whether it be a purchased part, a part manufactured in the plant, or a product of outside manufacture. These cards serve the combined purpose of a single ordering reference, a resource record, a purchasing quantity record, and a cost record. From his close relationship with production control schedules, Mr. Kouf knows the current and probable future requirements for old and also new items in question.

As an example, take an engineering change notice on the valve body. The casting drawing accompanies the change notice to illustrate where a ½" flange and ¼" dimension deletions take place. Mr. Kouf then calls in the vendor to see if the existing pattern can be changed to meet requirements or whether a new pattern must be made.

Most of the parts manufactured by outside producers to General Control's specifications are made with materials purchased and supplied from General Controls. In effect, the purchasing department has much the same relationship to parts manufactured outside, as to those made in the General Controls plant, and is responsible for coordinating this manufacturing. Consequently, when parts for the same completed unit come from both sources, the standard specifications of the same materials (including alloy, hardness, etc.) and the dimensions, will conform one to another in all respects.

It is the responsibility of Mr. Kouf to obtain or specify the dies, fixtures, patterns, and other special items used by outside manufacturers in producing his orders.

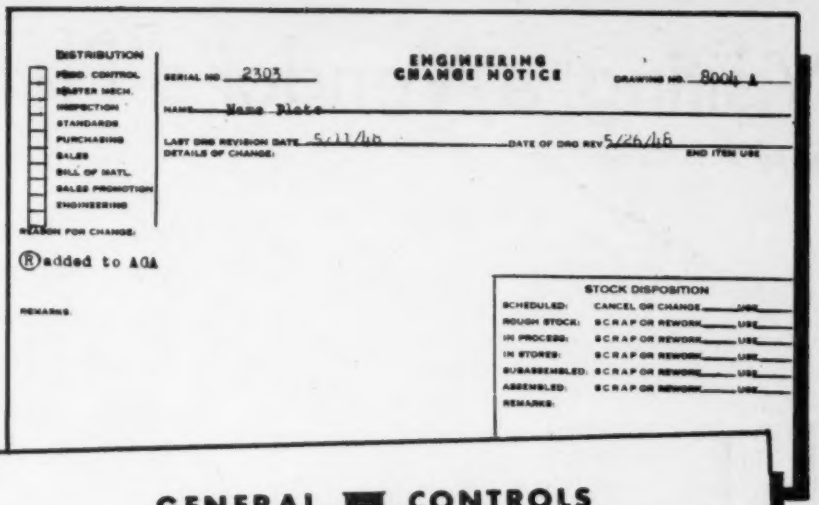
As an example, there were some gaskets that had to conform to certain specifications. No stock gaskets were manufactured in the proper size and shape, from what was determined to be the ideal material. These sizes were available only in

materials of lesser suitability; therefore provision was made Mr. Kouf to supply a special die to the vendor who had the chosen gasket material.

Another instance is the matter of die castings. Purchasing determines the number of cavities in the die for the most efficient production speed in relation to the estimated consumption. When a greater consumption of these die-cast parts indicates that a die with a greater number of cavities will be required to maintain the most efficient production costs, Mr. Kouf determines just what number of cavities should be used and provides such a die.

All through the organization there is very close cooperation, and every responsibility is delegated to the person best suited to handle it. The company has a policy of procuring new machines or tooling whenever it can be shown clearly that they are required to cut costs, raise production or improve quality. For instance if a product engineer assigned to make a tooling survey finds different needs and ideas, he compiles a plan or proposal. This is made the subject of a conference with Messrs. Kelly (Master Mechanic), Boomer (Tooling Superintendent), Blattenberg (Methods and Standards), Zahner (Feeds and Speeds), and the engineer. Then if a decision is made to construct the new tooling, it is worked out in full detail with drawings, all data is typed up, and this material is sent

(*Please turn to page* 298)



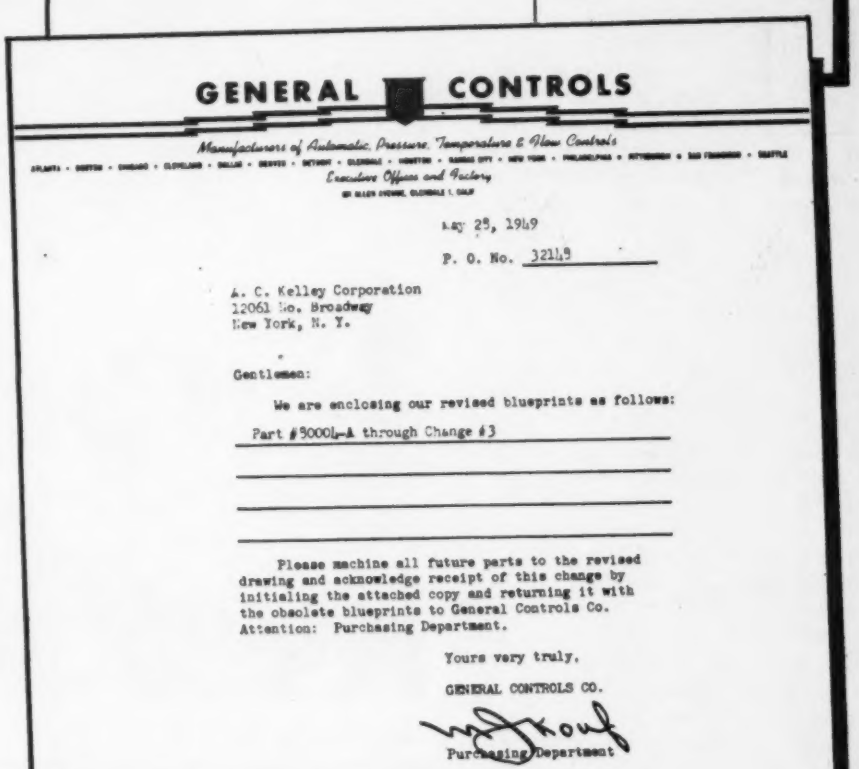
DISTRIBUTION
PROD. CONTROL
MASTER MECH.
INSPECTION
STANDARDS
PURCHASING
SALES
BILL OF MATL.
SALES PROMOTION
ENGINEERING
REASON FOR CHANGE:

SERIAL NO. 2303 — ENGINEERING CHANGE NOTICE — DRAWING NO. 8004-A
NAME: Name Plate
LAST DRG REVISION DATE: 5/11/48 — DATE OF DRG REV: 5/26/48
DETAILS OF CHANGE: — END ITEM USE

(R) added to AGA

REMARKS:

STOCK DISPOSITION
SCHEDULED: CANCEL OR CHANGE USE
ROUGH STOCK: SCRAP OR REWORK USE
IN PROCESS: SCRAP OR REWORK USE
IN STORES: SCRAP OR REWORK USE
SUBASSEMBLED: SCRAP OR REWORK USE
ASSEMBLED: SCRAP OR REWORK USE
REMARKS:



GENERAL CONTROLS

Manufacturers of Automatic, Pressure, Temperature & Flow Controls

ATLANTA • BOSTON • CHICAGO • CLEVELAND • DALLAS • DENVER • DETROIT • GLENDALE • HOUSTON • KANSAS CITY • NEW YORK • PHILADELPHIA • PITTSBURGH • SAN FRANCISCO • SEATTLE

Executive Offices and Factory
801 ALLEN AVENUE, GLENDALE 1, CALIF.

May 25, 1949

P. O. No. 32148

A. C. Kelley Corporation
12061 No. Broadway
New York, N. Y.

Gentlemen:

We are enclosing our revised blueprints as follows:

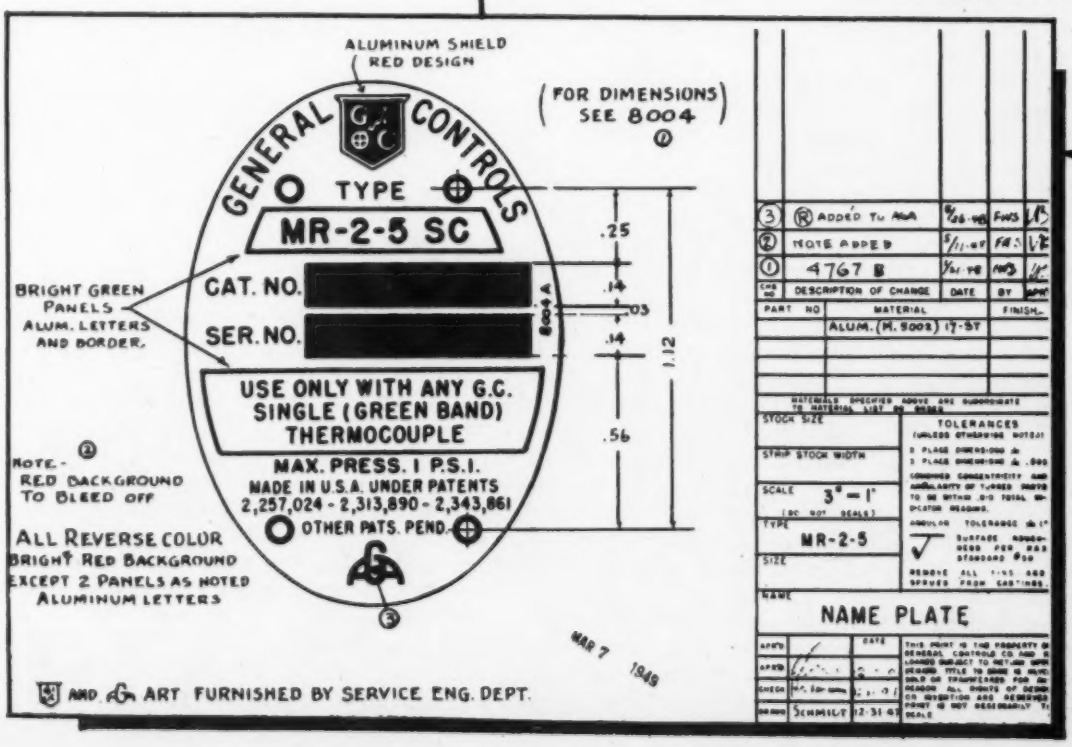
Part #9000b-A through Change #3

Please machine all future parts to the revised drawing and acknowledge receipt of this change by initialing the attached copy and returning it with the obsolete blueprints to General Controls Co. Attention: Purchasing Department.

Yours very truly,

GENERAL CONTROLS CO.

Purchasing Department



Engineering changes are incorporated in the part drawing, each revision being indicated by number and description. Change notices are distributed to all departments affected, and vendors are advised by the purchasing department, with revised copy of the drawing to supersede earlier instructions.

Visiting a Vendor's Plant

● By E. L. Cady

You'll see more in the plant if you know what you are looking for

Inspection procedures are usually a good indicator of plant values

Visualize your own purchases in relation to the vendor's operations

THE first important step in visiting a vendor's, or prospective vendor's, plant is one that is most often neglected. The visitor rarely prepares himself adequately to take full advantage of his visit.

Mark Twain once noted that when, as a river pilot, he was at the upper end of the Mississippi he could remember every detail of every eddy and sand bar there but could visualize nothing about the lower end, and when at the lower end the reverse was the case. Factory visitors depend upon being able to remember every important detail of foundry practice when in a foundry, and every detail of paper mill procedure when in a paper mill, and so on. But if the purchasing agent will recall the lapses and the apparent blindnesses of sales engineers and others who have gone through his plant, he will realize how little this "detailed memory" is to be trusted when visiting another manufacturer's plant.

Some vendors issue booklets on the general subject of "our plant and our processes". Although such a booklet is highly helpful if read just before the visit is undertaken, it cannot tell the individualized story the buyer wants to get. The booklet is a general sales tool intended for *all* who might be interested. It is not pointed at just one prospective visitor.

Two or three hours devoted to skimming through a technical book on the subject of the industry to be visited will give the mind a general preparation. This reading is in the nature of a "brush up course".

There almost always is some one process or procedure in which the buyer will be especially interested. This may be studied by reading one of the specialized chapters of an engineering hand book.

For example, a buyer was told that a prospective vendor had purchased some internal broaching equipment which could increase quality while reducing costs. Only fifteen minutes of reading a section of a hand book got the buyer's mind all primed with sharply pointed suggestions as to what that equipment might be able to do. As a result the buyer returned from the visit with prices some 5% lower than he had expected to obtain, and with details of broach-chatter elimination so worked out that a planned honing operation in the buyer's plant could be discarded.

Watching the other fellow's order go through a plant may furnish the clue to production economies.

Trade and technical magazines should be consulted for feature stories and even for short items having to do with the industry in which the plant to be visited operates, and especially for items pertinent to the specific process in which the buyer is interested. If the "latest thing", as described in these magazine articles, is found to be in operation in that plant, then the benefits of new developments can be assayed and the findings applied as a measurement of all vendors who might make use of those developments. And if the latest developments are not found to be in operation, then the reasons for not acquiring or adopting them can be equally informative. Sometimes the plant to be visited will be found to be slow to adopt improvements, but more often a specific improvement will either be too far advanced for present application or else out of line with what this one plant is trying to do. Thus a study of improvements, and a checking of the reasons why they have or have not been applied, can serve as a measure of the true values of the improvements and also can be a basis of predictions as to when and where the real benefits of the improvements will take effect.

Study of the latest inspection and other quality control methods applying to the industry to be visited is of the highest importance.

The ideal mental attitude for a plant visit is that in which the buyer has a specific problem which he wants that plant, or one of its competitors, to solve, but he also is willing to observe and to learn anything new that he can. The buyer thus is to be 50% a salesman of what he wants to have done, and 50% a reporter on what he sees.

The 50-50 Mental Attitude

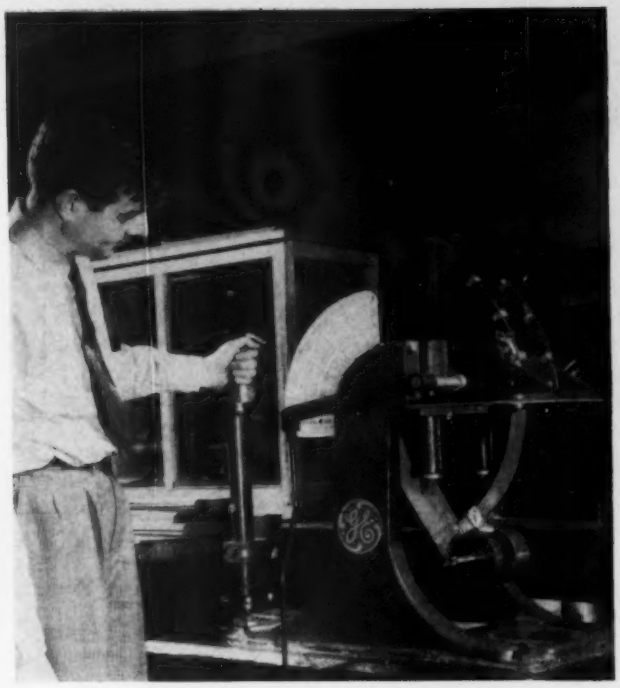
For example, in order to meet the projected sales prices and volume for a product of his house, a buyer knew that the costs of stampings would have to come down 10% while the production lots were being reduced 20%. Here was something he would have to "sell" to a stamping plant he planned to visit, or else would have to "sell" to some other stamping plant.

As a reporter, he would have to keep his mind alert for the totally unexpected, the advantage which might be in plain sight but easily could be overlooked. The reporter's formula for getting a story is in the queries: "Who, what, when, where and why?" Since the preparation for the visit would pretty well take care of "who, when and where" he could center his attention on "what and why". And of these, the most important is to look at everything in the plant, even at the most ordinary or casual appearing objects, and mentally ask "why".

The "why" can lead to strange by-products of plant visits. A purchase engineer on a visit to a conveyor belt maker's plant observed a highly controllable belt stretching device in action, reported on it to his own production manager, and thus gave that manager an idea for building a similarly controllable hydraulic tool for the quick positioning of heavy castings on a planer bed.

Another buyer saw a pneumatic cylinder in use to close a safety gate more rapidly than gravity alone could close it, yet bring the gate to a gentle stop so it would not injure the personnel it was to protect. He applied the same forced drop but gentle stop idea for getting batches of aluminum parts from the floor of a furnace to the surface of a quenching bath in very rapid time and also easing them into the bath without splashing.

A purchasing agent watching standard type shoe eyelets being assembled to the leather, suddenly realized that these eyelets, inexpensive because they are made by the millions in standard sizes, were the answer to a spacer-washer problem in one of his products.



Give particular attention to the vendor's inspection and quality control points and methods.

Enter By The Back Door

The "natural" way to visit a plant is to enter with the raw materials and follow them through the various processes until they become a finished product. And if the plant is being visited out of pure curiosity, this is a good way to go through.

The purchasing agent who has a definite objective in visiting a plant should begin with the department for which quality is controlled, and should trace everything onward from there. His reasoning should be that the "why" of quality control is the first key to the abilities of any plant, and the "how" of quality control is the second.

In the case of the buyer who needed to reduce his costs for stampings 10% while reducing the production lots 20%, the finishing department of the stamping plant proved to be the one for which quality control measures were operated. Most of the products of this plant were plated and polished. In order that the "color" of the polishing might "come up" under the craft of the employees who operated the polishing machines, all stampings were brought to a controlled degree of mild spring temper. This spring temper was not of the kind that had an engineering index number, a standard measurement which could be found in a technical book. If the operatives felt that springiness beneath their fingers they could color, and if not then they could not.

The buyer pointed out the fact that his products did not need polish coloring. The stamping plant had been interested in his business in the first place because he needed the same gages of steel and the same general sizes of stampings as the regular product, and therefore his orders would be fill-in business for the idle time of the plant. Now he pointed out that the plant also could use for him stock which failed to come to the polishing temper, and that since this stock had had to be specially heat treated or else shipped back to suppliers for replacement, he was offering an additional saving on that point. With this and some slight design modifications to reduce tool maintenance costs, the problem was solved.

Watch Vendor's Inspection

The inspection department may be the key point from which to start.

A buyer was specifying limits of plus .0000 minus .0005 inches on hardened and ground automatic screw machine products. A trip to the plant showed that this meant 100% inspection for that particular piece.

He stipulated that if the plant would agree to work by the "limits within limits" technique, to hold the limits as shown by the dial gages at the grinding machines to minus .0001 minus .0003 inches, he would change his own specifications to read plus .0001 minus .0006 inches. This would mean that if the plant

would reasonably aim at working within .0002 instead of the present .0005 inches, then instead of requiring that all shipments be held to .0005 he would let shipments fall within .0007 inches. This would reduce the inspection need to check lots of only 5% of production, with consequent reduction of costs.

His reasoning was good. Specifying of the former limits had been necessary because parts could season-warp more than .0001 on either side of the limits, and because differences in the operations of inspection instruments by different inspectors needed to be covered by a .0001 factor of safety. But if much tighter limits were set right at the grinding machine, as they easily could be, then he could permit full leeway for all sorts of warpages and inspection mistakes and still come out with a satisfactorily precise product.

An extreme need for inspection of parts always indicates that something is wrong. Either the production machines in use in the plant are not capable of working well within the limits required by the product, or the raw materials are of such natures that they cannot be trusted to stay within the physical or chemical specifications of the product, or else the product itself must meet such critical service requirements that only extremely close inspection will assure that it will do so. There are, of course, a few such critical service requirement products, but in most instances a critical inspection need is a good place to begin critical thinking. The thinking should be followed through until the fault which sets up the inspection costs is found.

When the product of the plant to be visited is a complex machine, the assembly line is likely to be an objective of quality control. Here the holding of dimensions which will facilitate rapid assembly is important. And the protection of parts which might be damaged during assembly should be observed.

Much depends upon whether the purchasing agent has any voice in the properties of the parts which are to go into the assembly. If he is buying a machine tool for use in his plant, then he probably can specify little of its make up, and his observations must be confined to judging whether or not the materials in use and the methods of handling them are likely to result in the quality of machine he wants.

When the product is a sub-assembly of the buyer's own product, or is something else which he buys in larger quantities, then he is in position to ask a series of questions which are based on that all important word "why".

Are special parts being used when lower cost standard ones apparently would do as well?

Are fragile materials, difficult to protect up to and at the assembly line, being used?

Are specifications either tighter or looser than they should be for most economical assembling?

Exactly where would the savings possibilities be if he increased the quantities on his individual orders?

Just where would the losses, justifying higher unit prices, be if he decreased the quantities on his individual orders?

Finding a possibility of making a saving, and selling the producer on the cashing of that idea, are entirely different problems. The buyer may need to plan a long time campaign to this end. But at least the plant visit should show where the improvements are possible so that a start can be made.

In addition to his personal notes of everything of interest he observed, the buyer should take all the literature about the plant and its products, all the copies of trade paper stories which have been published about that plant, and all similar materials that are offered him.

Second thoughts are very important to plant visiting values. "How was that again?" is a question which the visitor will ask of his memory many times. The pictures, the literature, the articles, can do a great deal to fill in these gaps.

Bits of information which, upon thinking the whole thing over, appear to have been missed, can be requested from the sales engineers representing the plant. The idea of what the plant can and cannot be made to do should be clear.

After the visit, general impressions will come to the mind. The plant had a character. It was either clean or dirty, noisy or quiet, orderly or disorderly, safe or hazardous. It depended greatly upon automatic controls or else it used more manual inspections and controls.

The clean, quiet, orderly and safe plants usually make better products, but may not be able to equal the prices of the other plants on medium and low quality output. After all, if the "modern and good" plants had all the advantages, the others would not be so plentiful.

Plants which depend greatly upon automatic controls usually are geared for the higher production runs, and unless standard products are to be bought, may not be the best sources for smaller quantities. But any good plant may have some automatic controls, such as those on salt baths and other universal heat treating equipments.

The values of plant visits should be judged on the "PPM" or profitability-per-minute basis. All plans should be aimed at that factor. The temptation of the plant is to get the visiting buyer into the office of the vice president in charge of sales, and with the exception of a brief and brisk walk past the machinery, to keep him there. But the buyer should get out where the product is being assembled, inspected and manufactured, and he should stay there. The sociability end of the visit can be handled after the purchasing agent has learned all he can at the machines. And so can most of the discussions of what shall be done about what he learns.

The vendor's equipment is important; so is his concept of plant management and housekeeping.

Spinning the yarn is the first step in textile manufacture.

Purchasing Textiles

Each class of textile fibers has its own standards and vocabulary

The buyer usually deals with an agent or factor rather than the mill itself

End-use requirements are important for making proper selection and tests

●

By Irving Teplitz

(Book rights reserved by the author)

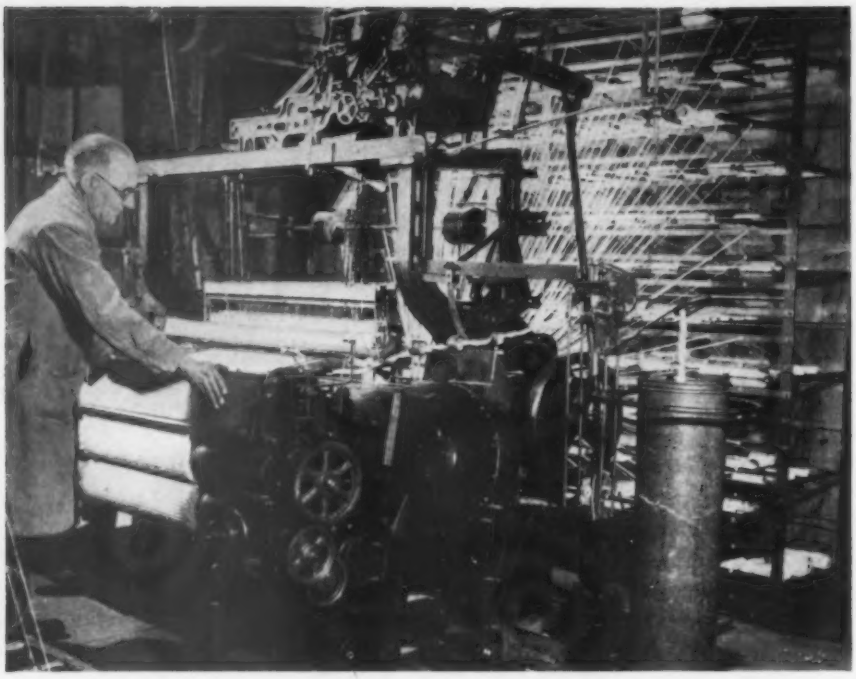
IN the apparel industries, the purchase of textiles is the biggest item in the acquisition of raw material, and is frequently assigned to the president or vice president of the concern. In textile manufacturing companies, the purchase of raw cotton, silk, or wool is also distinctly a specialist's job, requiring the services of a person who is not only thoroughly familiar with the materials themselves, but with futures markets, foreign exchange and importing practices.

There are many instances, however, where textiles are but one of the many commodities procured in the normal course of purchasing department activity. The requirement may be fabrics for shoe linings, cotton yarns for wire insulation, cotton bags for packaging, cord, or any one of a hundred miscellaneous uses. This article is designed to outline the problems and principles of such textile buying.

Textiles are made up of fibers (the smallest unit), which are spun into yarns, which are further fabricated into cloth by weaving or knitting, and perhaps further dyed, printed, or finished. The textile industry is highly organized, and the necessary information is available and easily accessible. Prices of all textiles are daily published in trade newspapers such as the *Journal of Commerce, Daily News Record,* and *Women's Wear*. Such journals give excellent and complete coverage of all price movements and trends for a wide range of fibers, yarns, and fabics, unfinished or in the gray, and finished. Usually, to protect their trade sources of information, they report prices slightly higher than the actual low market price, but the individual who knows this and has checked in the market for quotations quickly learns how to evaluate the report price. For example, the paper may report the price of 20/1 carded cotton yarn, knitting twist, as 62¢ per pound; to the experienced reader and buyer, this means that he can probably secure the yarn in the range of 59¢ to 60¢ per pound if he tries hard enough.

A most important feature of the textile business is its lack of definite, fixed standards as to quality of merchandise. The sale of rayon yarn, for example, is controlled by very large companies. These companies have their own methods of grading yarn as first quality, second quality, inferior, substandard, and run of the mill. The standards of first quality may differ between two companies, as it might for the other qualities as well. The same holds true for cotton yarns and fabrics, and an examination of market records will show that the product of Mill No. 1 always sells as a premium over the product of Mill No. 2, even though the item is sold as the same fabric construction or yarn count. For example, it is generally accepted in the textile trade that silk fabrics manufactured in the New Jersey area are liable to be dirty and their use is largely confined to printed cloths, whereas the product of the Pennsylvania mills is not so restricted, but may be used for solid colors or prints.

Raw silk is sold according to set standards and rules. Where there are no standards, the purchaser had better try to ascertain what the standards are supposed to be, and in this way avoid misunderstanding and possible loss. The writer, for example, has purchased 8/1 cotton yarn which theoretically has a yardage of 6,720 yards to the pound. The cotton count was checked and the yarn was found to be 7/1, with a yardage of 5,880 yards to the pound, a decrease amounting to about 15%.



Weaving is a complicated process, to provide the various types of fabric constructions required.

Upon checking the standards, it was discovered that there are no definite rules as to permissible variation of a cotton yard count, and the delivery of 7/1 on an 8/1 sale was permissible.

If the yarn is not used, the manufacturer will usually take it back and substitute another lot. However, if the yarn is used and claim is made for defective fabric results, the yarn manufacturer would not be liable. This, then, is the custom and practice of the textile business where there are no strict standards of quality: the customer is usually given the right to return merchandise and have another lot substituted, but he cannot make any claim if he fails to return the yarn, except in flagrant cases of faulty delivery. If the buyer contracts for cotton and gets a blend of cotton and rayon, or asks for 8/1 and gets a 6/1 or 5/1, then he would be able to hold the seller for defective delivery, but in the borderline cases where it is difficult to ascertain if the delivery is or is not defective, in the absence of set standards, the rule stated generally holds.

Fabric is usually sold by construction. Construction is the width, weight, count of the yarn sizes per inch, and often includes the size of the yarn. The very well known cotton print cloth sold in millions of yards for almost every conceivable purpose, is known as 80-square, or 39″ 80 x 80 4.00 yard. This means that the cloth is 39″ wide, has a thread count of 80 threads to the inch of warp and 80 threads to the inch of filling or weft, and weighs 4 yards to the pound (or 4 ounces to the "running yard" 39 inches wide).

The number of threads to the inch can be readily counted by means of a counting glass which magnifies 5 times and can be purchased at any good stationery store for about $2. Woven cloths have warp ends which run vertically and filling threads or picks which run horizontally; in knitted fabrics, the vertical yarns are known as wales and the horizontal threads are courses. Cloths are woven in three basic weaves—plain or taffeta, twill, and satin. There are variations of these weaves, such as the basket weave, which is a plain weave; the herringbone or gabardine, which are basically twill weaves; and the lustrous satin weave.

Yarns are described according to the ratio of yards per pound, and while the language is different for cotton, silk, rayon, and wool yarns, the basic denominator is yards per pound. Cotton is sized by "counts": 1 cotton count is 840 yards to the pound, 10 count is 8,400 yards, and 100 count is 84,000 yards. If the count is a two-ply yarn, the yardage is half of the single count, the 10/2 yarn being 4,200 yards and the 100/2 being 42,000 yards to the pound. Rayon and silk sizes are described by the "denier"; 100 denier is 44,600 yards per pound. The worsted yarn count is 560 yards per pound.

With this information, the trade paper reports can be read with understanding. For example, acetate satin, sweetheart type is listed as 42 200x72 75/120 40¢. This means that the cloth is 42″ wide, has 200 warp ends of 75 denier acetate and 72 filling threads of 120 denier acetate, and sells for 40¢ per running yard.

The trade directory for the textile industry is the Blue Book published by Davison Publishing Co. of Ridgewood, N. J. It gives complete listings of all firms connected with the industry in the United States—mills, weavers, knitters, yarn spinners, dyers, coaters, rubberizers, commission merchants, and the like. Many cloths are sold under trade names, which may command premium prices. For example, "Tackle Twill" suggests its application for football pants. Often, however, the ultimate consumer of a product is not concerned with the specific fabric designated by the trade name, whether he is using it for football pants, auto seat covers, or any other product.

The method of marketing textiles may be unfamiliar to a newcomer in this field of buying. The XYZ Mill of Charlotte, N. C., may sell all its product through the XYZ Selling Agents of 40 Worth Street, New York City, exclusive agents, who handle all the details of the sale, including financing, delivery, and checking of credit. The ZYX Mill may have its accounts factored by the ABC Factors, who handle financing, credit checking, and collection of accounts receivable, but do not concern themselves with the physical delivery or other mechanics of the sale. Where a factor comes into a textile transaction, the manufacturer takes on some of the functions of a seller and the rest are delegated to the factor. The factor often makes advances to the manufacturer as soon as the invoice of sale is issued. In such cases, the sale by the manufacturer is subject to consent and approval of the factoring concern, and payment by the purchaser is to the factor, not to the manufacturer.

Purchases of textiles are usually confirmed by a contract. These contracts invariably provide for the settlement of all disputes arising out of the contract by arbitration, according to the laws of the State of New York. This precludes settlement of textile suits by judge and jury in a court of law; the court

(*Please turn to page 298*)

How to Buy Zinc

• By Henry Toy, Jr.

American Zinc Co. of Tennessee photograph

Drifting Jumbo or drill at work in a zinc mine. The crude ore contains a relatively small percentage of valuable minerals.

This article is one of the three prize winning papers in the "How to Buy" contest sponsored by the N.A.P.A. Committee on Education. At the time this paper was written, in December 1948, Mr. Toy was Manager of the Priorities Department and Buyer of non-ferrous metals for E. I. du Pont de Nemours & Co., Wilmington, Delaware, and a member of the Philadelphia Association. He has since resigned that position to accept an appointment as Executive Director of the new National Citizens' Commission for the Public Schools, New York, N. Y.

WHEN thinking of zinc, the natural tendency is to visualize the product as it is sold commercially. The recognized form is spelter, but there are several steps preceding the preparation of spelter for marketing.

The origin of zinc spelter is ore, zinc itself not occurring free in nature. Zinc minerals are widely distributed over the world, and are frequently associated with ores of other metals, notably lead. They are classed as sulphides, silicates, carbonates, exides, and sulphates. The sulphide is the most widely distributed and is the principal source of zinc. Sulphide deposits of commercial importance appear in many parts of the world.

Included in the sulphide group are two minerals known as Blende (which is common) and Wurtzite (which is rare). In some cases they will be found as a mixture. Blende contains some iron and is of a reddish brown color, becoming darker as the iron content increases. It is often called Black Blende or Marmatite.

The silicates, or Willemite mineral, occur in Cambrian limestone. The only known large deposits are in New Jersey. It is apple-green in color and contains a greater amount of zinc than some of the other minerals.

Oxides, such as Zincite and Franklenite, also occur in deposits of Cambrian limestone in New Jersey. Zincite is deep red to orange-yellow. It contains a much higher percentage of zinc than Franklenite, which is iron black and contains so much iron as to permit magnetic separation from Zincite and Willemite.

The three minerals, Calamine, Smithsonite, and Hydrozincite, occur together in oxide zones of deposit, forming the so-called carbonate ores. Calamine, a white mineral having a bluish to greenish shade, is very common. Smithsonite, also white, but often grayish or greenish, is rare in the United States but more important in Europe. Both are likely to be impure and found as earthy incrustations rather than in crystalline form. Hydrozincite forms an earthy to compact white to yellowish incrustation.

Goslarite, which represents the

U. S. SLAB ZINC PRODUCTION

	Average 1935 – 1939 Net Tons	%	Average 1940 – 1944 Net Tons	%	1945 Net Tons	%
BY SOURCE						
PRIMARY:						
Domestic Ores	476,444	91	608,249	68	467,084	57
Foreign Ores	8,206	1	231,906	26	297,477	37
	484,650	92	840,155	94	764,561	94
REDISTILLED SECONDARY	40,891	8	51,774	6	49,242	6
TOTAL	525,541	100	891,929	100	813,803	100
BY METHOD						
PRIMARY:						
Electrolytic	116,698	22	262,322	29	269,924	33
Distilled	367,952	70	577,833	65	494,637	61
REDISTILLED:						
Primary Smelters	19,437	4	23,589	3	21,205	3
Secondary Smelters	21,354	4	28,185	3	28,037	3
TOTAL	525,541	100	891,929	100	813,803	100
BY GRADE						
SPECIAL HIGH GRADE			234,790	26	220,241	27
HIGH GRADE			216,446	25	191,639	24
GRADE "A"	167,603	32	451,236	51	411,880	51
INTERMEDIATE (GRADE "B")	60,170	11	67,254	7	49,106	6
BRASS SPECIAL (GRADE "C")			74,859	8	75,749	9
SELECTED (GRADE "D")			15,959	2	17,367	2
GRADES "C" "D"	69,725	13	90,818	10	93,116	11
PRIME WESTERN (GRADE "E")	228,043	44	282,621	32	259,701	32
TOTAL	525,541	100	891,929	100	813,803	100
TOTAL WORLD PRODUCTION	1,688,000		Not Known		Not Known	
U. S. as % of World			31			

sulphate group, is of little importance as an ore and is considered a secondary material.

These minerals are not generally sold in the same form as taken from the ground. They are prepared at the mine, in most cases, and sold as ore concentrates.

Most of the zinc ore mined in the United States must be concentrated before shipment to the smelter. Some production among the carbonate ores is acceptable to smelters after a rough hand sorting, but in most cases a more complicated dressing operation is undertaken. The purpose is to remove some of the impurities, thus increasing the zinc content of the ore.

The initial step is the crushing of ore to smaller particles, to facilitate handling in subsequent stages. Concentration may be carried on by various processes—hand-picking, wet-gravity separations, amalgamation, magnetic, electrostatic, pneumatic, adhesion or flotation, and screening. Some of these terms are self-explanatory; therefore a brief explanation is needed for only a few of the more important methods.

In wet-gravity separation, the ore is sent with water over a table, which is provided with a bumping or jerking motion. The heavy materials move in one direction and the lighter materials in another, thus separating some of the impurities from the zinc and increasing the zinc content of the ore.

The most popular method of concentrating is the flotation process. Finely divided ore is agitated in water with gas and one or more other reagents, one of which is usually an oil. Certain minerals rise in a froth at the top of the solution, while others do not. This action causes a separation of the particles and concentrates the zinc content.

Complex ores consist of an intimate mixture of zinc, lead, iron, and copper sulphides, together with small but valuable amounts of precious metals such as gold and silver. The metals are so closely interlocked and the minerals are so finely grained, that direct treatment by zinc smelters to recover the low zinc content is not advisable. If done, it would interfere with recovery of the remaining metals by a lead or copper smelter. Development of the flotation process reduced this problem, and transformed the zinc in some mines from a deleterious constituent to one of value. Also, many ore bodies which had no commercial value became useful for both lead and zinc.

Prewar, when world statistics were available, the United States was producing around 30% of the world's supply of ore. The other leading producers were Canada, Australia, Germany, and Mexico, while another 12 to 15 countries produced the balance. South America is currently producing considerable tonnage for export to the United States.

Idaho and Arizona are becoming increasingly important as zinc producing states, but the Tri-State area (Kansas, Southwest Missouri, and Oklahoma) is still the top source of U. S. zinc ore and, incidentally, the leading producing region in the world.

There are two schools of thought as to our national resources of zinc minerals. One group, including government officials and trade journals, claim that in about twelve years we shall have exhausted our reserves and will have to depend on foreign sources for our supply. On the other side, mining men claim that we are not likely to become a "have not" nation. They feel that, with good prices for their production, they can justify further development and bring in more deposits not now known. Because of this divided opinion, a zinc buyer must be cautious to obtain all the information possible concerning the ex-

pected life of any mine with which he deals.

The average zinc content of concentrates shipped to the smelters is around 58.5%. The methods of extracting the zinc from the ore differ from those used for some of the other common metals. In the production of iron, copper, and lead, the metal is formed in the molten state in a large furnace and drawn off at the bottom. In the case of zinc, production is either (1) by distilling or vaporizing the zinc and subsequently condensing the metallic vapor, or (2) by dissolving it in acid and then precipitating it from solution by an electric current. The art of zinc smelting is simple in principle, but more complicated in practice. It depends on the reducibility of zinc oxide by carbon and carbon monoxide, or both.

Refining Zinc

Sulphide concentrate still contains considerable sulphur, which is driven off before smelting by roasting the ore in the presence of air. This yields a desulphurized zinc ore suitable for smelting; zinc oxide, a commercial product; and sulphur dioxide, which is usually converted to sulphuric acid. Many different types of furnaces are employed.

Oxide ores are put through a process known as calcination before smelting, to drive off water and carbon dioxide and to disintegrate the ore. Otherwise, these would have to be expelled in the smelting retort, which is most expensive and may cause oxidation of zinc vapor.

The horizontal retort is the oldest and most common method used in the United States for producing metallic or commercial zinc. Ore is mixed with coal and charged into small, externally fired horizontal retorts. The carbon of the finely divided coal unites with the oxygen of the zinc oxide, liberating metallic zinc in the form of a vapor. A condenser is attached to the retort and the molten zinc is tapped off at intervals. When the zinc is largely reduced, the charge is removed and cast into slabs of about 50 pounds each. Periodically the retorts are cleaned by blowing them out with live steam. The residues recovered frequently have a value to lead smelters for further treatment.

Another method employs a large vertical retort. The ore and coal are briquetted and charged into the retort at the top. The charge moves continuously down through the retort and the zinc vapor passes into a condenser in a continuous stream. This is a continuous process, while the horizontal retort is a batch method.

The third important method is the electrolytic process. The ore is dissolved in sulphuric acid, and the zinc is plated out of the resulting zinc sulphate solution by electrolysis. The deposit is periodically stripped from the cathodes and melted into slabs for marketing.

From the foregoing, it can be seen that fuel is a most important raw material in zinc smelting. Accepted averages show that about 2.5 tons of coal are used for heating purposes, and almost one ton of coal for reducing purposes (in the mixture), per ton of spelter produced. In some cases, gas or oil is used instead of coal for heating.

Primary smelters are those who beneficiate ores plus old metallic material. There are 23 primary zinc reduction plants in the United States; 14 of these are horizontal retort plants, with approximately 74,000 retorts in operation; 4 are vertical retort plants, with 75 retorts; 5 are electrolytic plants, with a total of 3,210 cells. Three of the horizontal retort smelters closed down in 1947. These plants were rather costly from an operational standpoint and could not produce metal profitably. It is expected that their production will be replaced by expansion at other plants.

Secondary smelters produce material similar to that produced by primary smelters, but they treat old material only. There are 13 secondary zinc smelting plants in this country, one of which is now idle.

The proportion of spelter production (primary smelting vs. redistillation) has been rather stable, although during the war imported ore played a very important role in comparison with prewar years. The war also had the effect of increasing the popularity of electrolytic smelting.

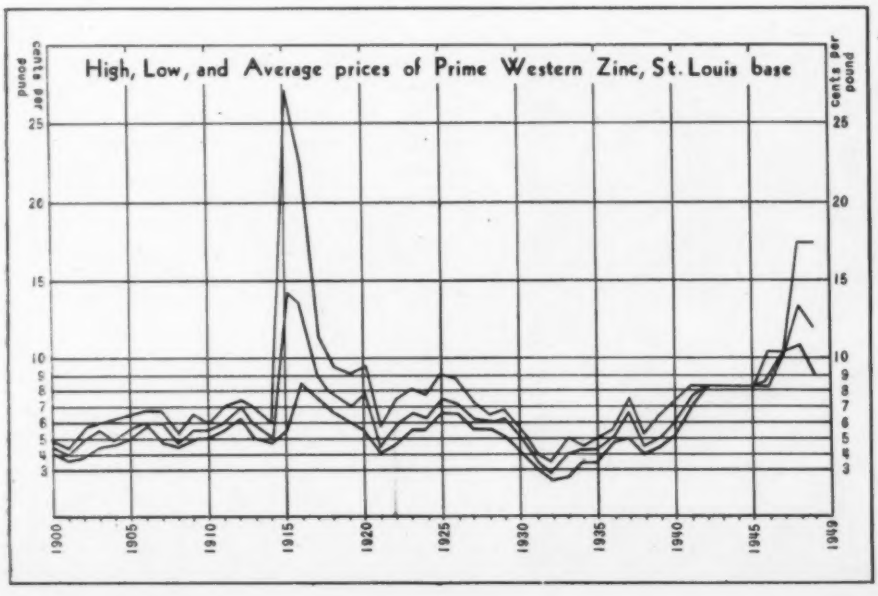
Refined Zinc and Its Products

Commercial zinc production in the United States includes slab zinc (spelter), dust (blue powder), and the zinc content of oxides (including leaded zinc), lithopone, zinc sulphide, and zinc sulphate. Insofar as these products come directly from domestic ore, spelter is the zinc of commerce.

1945 Production

	Net Tons	%
As Spelter	505,400	78.6
As Dust	2,900	.4
In Oxides	119,000	18.5
In Lithopone	12,000	1.9
In Sulphide	?	?
In Sulphate	3,500	.6
Total	642,800	100.0

Spelter. Total U. S. production of slab zinc includes primary production from both domestic and foreign ores and the redistillation of secondary zinc. The methods employed, in order of volume, are: distillation, electrolytic, and redistillation. Slab zinc is produced in



six commercial grades: Special High Grade, High Grade, Intermediate, Brass Special, Selected, and Prime Western.

The distinguishing feature among the grades of spelter is the amount of lead, iron, and cadmium contained and the presence or absence of aluminum. Maximum impurities allowed in each grade and the types of industries consuming the various grades of metal are shown in the accompanying tables. The galvanizing trade is the largest consumer of slab zinc, using mainly "Prime Western". The highest grade material (Special High Grade) is second only to Prime Western in total use; it is used largely in the die casting trade, which is the third largest consumer of spelter.

Secondary slab zinc represents only about 6% of total U. S. spelter production. It results from the melting of scrap and drosses and is likely to be impure from an admixture of other metals. Generally it contains as much as 5 to 8% of iron and lead combined.

Zinc spelter is often referred to by brand name. There are more brands than there are producers. "Metal Statistics" (published by the American Metal Market Co.) lists the various brands, their description, and the producers.

Zinc Dust is derived as a by-product in the distilling of zinc from ore and condensing the vapor for spelter. In general, it is returned for redistilling. Domestic production is derived mainly from redistillation of dross and other secondary material in the form of scrap zinc and alloys. Commercial zinc dust is also known as "zinc gray". It is close to 100% zinc, and may almost be regarded as spelter, insofar as zinc is concerned.

Zinc dust is used as a reducing agent in the synthesis of dye intermediates and other organics, and in the manufacture of sodium and zinc hydrosulfite and other chemicals; in sherardizing iron and steel products; as an ingredient in soot removers, in pipe-joint lubricants, metallic zinc paints, and fireworks; as a deoxidizer for bronzes; in the precipitation of heavy metals from solutions; in the recovery of gold and silver in cyaniding processes; in purifying fats and oils; in bleaching mechanical paper pulp; and in metallizing paper.

Perhaps the most important of these uses in the United States is sherardizing, a process of coating other metals with zinc. It differs from galvanizing in that the articles to be coated are heated with zinc dust in a closed vessel. Zinc vapor is given off below the melting point of zinc, and combines with the surface of the article to be coated. A firmly adherent, very uniform coating results.

Zinc Oxides are derived chiefly from concentrates of sulphides and calamine. They are used in paints, pharmaceutical preparations, in the manufacture of rubber articles, in pasteboards, and in enamels.

Zinc Chemicals. Zinc residues play a large role in the manufacture of chemicals. It is important to note that the amount of secondary material used for this purpose is controlled by its availability. Residues are not produced for sale; they result as a by-product. The volume of by-product accumulated is not influenced by the demand for its use, as is the normal production practice, but rather by the demand for the prime materials produced in the same operation in which the residues are generated.

Lithopone is a combination of zinc sulphide and precipitated barium sulphate. Roasted ash, fume dust, and zinc sludges supply the zinc material when available; otherwise zinc concentrates must be used. The product sold most widely contains slightly less than 30% zinc sulphide, but there are other grades sold in smaller quantities, containing 50% and 60% of zinc sulphide, respectively.

The largest consumer of lithopone is the paint industry. It is one of the important ingredients of white and tinted house paints, both for exterior and interior application, and of industrial enamels. Road marking paints also consume large quantities of lithopone.

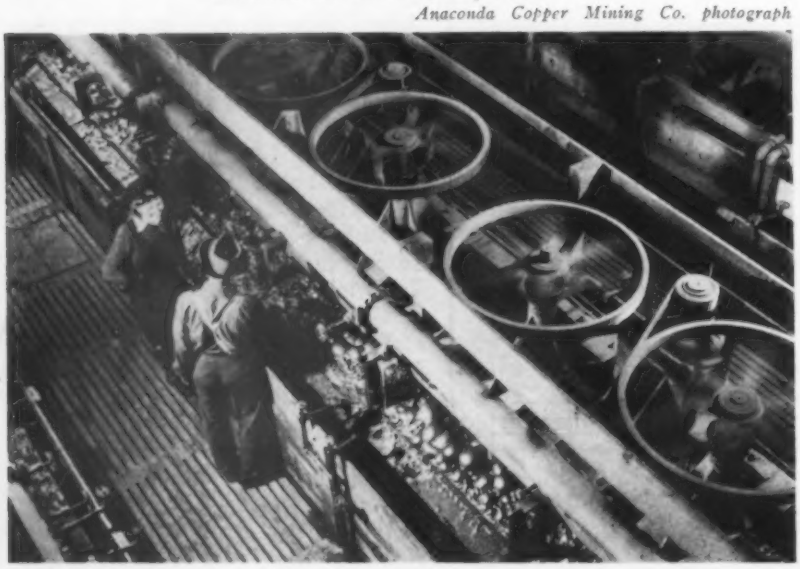
Varied Uses of Lithopone

Another large consumer is the floor covering industry, where lithopone is used as an opaque filler in battleship and inlaid linoleums to mask the dark color of other ingredients and to permit more attractive color designs. In the less expensive felt-base or printed floor coverings, it is the principal white pigment used in the coating which contributes to the durability and color design. In addition, lithopone is used for its pigment properties in coated fabrics such as oilcloth and shade cloth, printing inks, paper, rubber, leather dressings, etc.

There are five lithopone producers in the United States, operating eight plants. While the industry is relatively small, it is important in that lithopone is one of only three types of opaque white pigment available for the many essential requirements; the other two are white lead and titanium dioxide. Besides the competition between lithopone producers, there is also competition between lithopone and these other white pigments. When the shortage of these pigments is alleviated, the

Ore flotation machines. The flotable materials rise to the top and are skimmed off as a bubbly froth.

Anaconda Copper Mining Co. photograph



CONSUMPTION OF SLAB ZINC IN THE U. S. IN 1945, BY GRADES, ACCORDING TO INDUSTRY

	Spec. High-Grade	Reg. High-Grade	Intermediate	Brass Spec.	Selected	Prime Western	Remelt	Total
				NET TONS				
Galvanizing	10,909	8,049	10,505	8,759	1,387	294,234	3,338	337,181
Brass Making	65,802	119,999	17,952	21,906	6,013	26,497	1,208	259,377
Rolled Zinc	3,953	43,636	20,103	26,917	790	2,186	4	97,589
Die Casting	119,448	1,960	21	0	0	501	36	121,966
Other Uses	13,500	17,768	1,257	688	0	2,460	525	36,198
	213,612	191,412	49,838	58,270	8,190	325,878	5,111	852,311
				AS PERCENT				
	TOP LINE — as percent of total horizontal line BOTTOM LINE — as percent of total vertical line							
Galvanizing	3.2 5.1	2.4 4.2	3.1 21.1	2.6 15.0	.4 16.9	87.3 90.3	1.0 65.3	100.0 39.6
Brass Making	25.4 30.8	46.3 62.7	6.9 36.0	8.4 37.6	2.3 73.4	10.2 8.1	.5 23.6	100.0 30.4
Rolled Zinc	4.1 1.9	44.7 22.7	20.6 40.3	27.6 46.2	.8 9.7	2.2 .7	— .1	100.0 11.4
Die Castings	97.9 55.9	1.6 1.0	— .1	— —	— —	.4 .1	.1 .7	100.0 14.3
Other Uses	37.3 6.3	49.1 9.4	3.5 2.5	1.9 1.2	— —	6.8 .8	1.4 10.3	100.0 4.3
	25.1 100.0	22.5 100.0	5.8 100.0	6.8 100.0	1.0 100.0	38.2 100.0	.6 100.0	100.0 100.0

lithopone industry will undoubtedly feel competition more strongly, and production costs will become a very important item, along with import duties. These conditions will affect prices of zinc residue.

Zinc Ammonium Chloride is produced from sal ammoniac skimmings and zinc ash. It is used as a fluxing salt for hot dip galvanizing of pipe, tubes, tanks, malleable iron fittings, wire, etc. It is also used as a flux in metal soldering and tinning; in electric batteries; and in the manufacture of soldering compounds.

Zinc Chloride is manufactured from sal ammoniac skimmings, zinc ash, and galvanized scrap. Including numerous medicinal and industrial applications, its use is widespread. It is used primarily in the manufacture of tinning, galvanizing, and soldering fluxes; as an ingredient in dry batteries; for the preservation and flameproofing of railway ties, telephone poles, and other wood products; and in the manufacture of vulcanized hard fiber, intermediates, dyestuffs, and zinc soaps. Fluxes, primarily in the form of zinc chloride solution, are essential to the production of tinplate.

There are five firms in the United States regularly producing zinc chloride. Production has increased 50% above prewar requirements; therefore, keen competition is in sight on the domestic market. U. S. producers may also be faced with serious foreign competition. Imports increased from 382 to 667 tons in the period 1934 to 1937. Foreign countries could produce, ship, and pay duty into our country and still undersell us. The war at least temporarily changed that condition.

Zinc Sulphate is used in the manufacture of glue, rayon, electrogalvanizing solutions, insecticides and fungicides, zinc soaps and salts, fertilizers, pigments and dry colors, and as a preservative in casein products. Zinc ash is the principal source.

It is important for a good zinc buyer to familiarize himself with the flow of zinc from its mineral state to its consuming points, because of the effect that any one of the end uses may have on the zinc market.

During the representative year 1939, there were 206,933 net tons of secondary zinc recovered, while approximately 675,000 net tons of primary zinc were produced. Half of the recovery went directly into copper alloys, leaving slightly less than half for redistillation and chemicals. Almost all of this balance comes from the galvanizing trade.

Secondary Zinc

The galvanizing industry is the connecting link between the iron and steel industry and the zinc industry. For many years, galvanizing has been the most popular method of corrosion protection for iron, and it is the largest consumer of zinc. During 1945, 40% of total zinc consumption was by the galvanizing trade. In that year, 4.3 million tons of iron and steel were zinc-coated, using 337,000 net tons of zinc. Almost one-fourth of all zinc products are derived from secondary zinc, and the galvanizing trade provides most of the secondary

STANDARD SPECIFICATIONS FOR SLAB ZINC

Standard specifications for slab zinc (spelter) as last revised in 1937 by the American Society for Testing Materials (A.S.T.M. Designation: B 6-37), cover slab zinc (spelter) made from ore or other material by a process of distillation or by electrolysis, and not produced by "sweating" or remelting of secondary zinc.

The following table shows the grades and the maximum percentage of impurities allowed:

Grade	Lead	Iron	Cadmium	Aluminum	Sum of Impurities
Special High Grade	0.007	0.005	0.005	None	0.010
High Grade	0.070	0.020	0.070	"	0.100
Intermediate	0.200	0.030	0.500	"	0.500
Brass Special	0.600	0.030	0.500	"	1.000
Selected	0.800	0.040	0.750	"	1.250
Prime Western	1.600	0.080	.....	.....	.....

zinc for the chemical business.

Zinc by-products are sometimes prepared before sale. In the production of lithopone, it is not practical to use galvanizer by-products as generated, because of the high chlorine content. Some companies are equipped to roast the chlorine from zinc ash purchased from galvanizers. This roasted zinc ash is considered a most dependable product for lithopone production.

Many secondary brass smelters, either by preference or demands by city ordinances, have installed flue dust collection systems. These systems prevent zinc oxides from going out into the atmosphere in the form of smoke, and upon cooling in the system they condense into fine zinc oxide dust particles and are collected in a "Bag House". The product collected is frequently very high in zinc content. Many smelters who have installed these units have made their communities healthier places in which to live, and are also getting a decent return on their investments. The recent "smog" incident at Donora, Pa., may result in further installation of dust collection systems everywhere.

Some chemical operations using zinc dust as a raw material accumulate a sludge containing large quantities of zinc. These sludges are of value to a pigment producer.

A brief example of the reusability of zinc materials may be of interest. Zinc ore is taken from the ground, concentrated and shipped to the smelter. Aside from the many other outlets for the smelter's product, most of which have by-product recoveries, the spelter also goes to the galvanizer, who generates dross and skimmings. The skimmings are converted into a flux (zinc salt) by chemical companies, and the dross into a zinc dust by metal converters. The flux is returned to galvanizers and the cycle is repeated. Among the uses for zinc dust is the manufacture of zinc chemicals. Such processes often generate a zinc sludge by-product suitable for other chemical purposes. Notable among these is the manufacture of lithopone, an operation and a product which do not contribute to further zinc recoveries.

Marketing of Zinc

Before World War II, the London Metal Exchange occupied a very important position in the world metal industry. Quotations registered on the Exchange, representing transactions, were a guide to the world market for zinc, copper, and lead. The London Exchange has been inactive during and since the war, and although zinc is listed on our own commodity exchange, there are no transactions. Zinc, being a world commodity, is just as susceptible to fluctuations brought about by the forces of international supply and demand as are the agricultural commodities which are bought and sold on an organized exchange. The zinc market is very volatile. Perhaps the reason for having no active metal exchange in this country is the desire of large producers to sell directly to consumers.

In the absence of an active Metal Exchange, buyers must rely heavily upon commercial publications for current information about the market. A wealth of information about production, sales, stocks, etc., is constantly available to both buyer and seller. The information is regarded as being very accurate, and both buyers and sellers willingly accept the information reports as a basis for settling contracts.

There are four basic groups of sellers in the United States.

The Custom Smelter is dependent on purchased ores. He must buy his ore in advance, to convert to metal and sell to his customer. Since the selling price of his metal is largely governed by a "market", it behooves him to move his material fast.

He tries to run his business on the basis of obtaining a certain smelting profit. Because his purchases are based on the market at that time, it is his wish to sell immediately an equivalent amount of metal so as to hedge against a market loss. In other words, the custom smelter is not a speculator; he is in business to make an operating profit and not a market windfall.

The smelter has his easy times and his difficult times in selling his production. When the market is on the rise, it is easy to do. He may even raise his price to attract more ore to his smelter. In times when it is more difficult to sell his entire production, he either gambles on a stockpile or lowers his price. As a result, we normally have a sensitive market, subject to many fluctuations.

The Primary Producer. Some mining companies have their own smelter or refinery. They are in a different "driver's seat" than the custom smelter. Their outlook is more long-range. They think in terms of a satisfactory profit over a long period of years, and not necessarily a definite margin for each sale. Unlike the custom smelter, the producer might keep out of the selling market rather than force his production on an unwilling market by lowering the price.

The marketing problems for both are similar. In many respects, their problems are not unlike those of any manufacturer. They must watch and develop existing and new uses. They must know all the prospective uses for spelter and their customers' preferences by grades of material. They must also anticipate customer requirements. It is important that they know their competition, not just in zinc, but in other possible substitutes.

Secondary Converters and Dealers. In 1939, secondary zinc accounted for about 23% of the supply. Because of this substantial tonnage and further, because in the lead business scrap has recently

been of greater volume importance than primary material, the collection and preparation of scrap has become a most important business. There are almost as many secondary zinc smelters today as primary smelters. Mining interests have felt keen competition from secondary zinc smelters, particularly in time of plenty.

Perhaps most significant is the fact that these operators in the secondary field, both dealers and smelters, are exceptionally keen students of the metal markets. It is well recognized that they have their fingers on the pulse of markets, and their actions are watched carefully by others. Not infrequently, their bullish or bearish attitude is a signal on the direction in which the price of metal is expected to go.

Importers. Zinc in its various forms, from ore through finished product, moves between countries throughout the world. This is especially true of ore, because so much of it is needed in this country to augment our own mine production. This activity opens a profitable avenue of commerce for importing houses. These organizations are staffed with trained personnel to deal with foreign countries, acting independently or as agents for producers in those countries.

They perform a vital function. Because of their experience, they know sources of material in foreign countries and possible buyers in this country. Through these organizations, it is possible for a buyer to keep better informed of world trade, new developments, and possible new sources. Their purchases of entire lots and in turn making parcel sales to a number of smelters, help remove the risk for the smelters in a fluctuating market and make available considerable ore which would otherwise be unattractive.

Import Duties. As in other materials, tariffs on zinc are used to maintain a healthy domestic mining industry. While present domestic consumption is so high, this subject is not of material importance, but in times of surplus it does assume a major role in control.

The effective tariffs over the past several years include the Tariff Act of 1930, the Netherlands Agreement of 1936, the Canadian Agreement of 1939, the Mexican Agreement of 1943, and the Geneva Agreement of 1948. The rates range from 0.5¢ per lb. on zinc chloride to 2.25¢ per lb. on coated or plated zinc sheets and on zinc oxides ground in or mixed with oil or water.

Government Subsidies. A new and exceedingly important factor in the zinc market, as well as other metal markets, is the national policy of stockpiling for military purposes. While stockpiling figures are confidential, the known goal of an additional 60,000 tons is certainly an indication that the government will be a large purchaser and will compete with industry for zinc supplies. As long as this competitive feature exists, there is little hope for low prices; it can and has acted as a floor under the zinc price. In the fall of 1947, when many factors indicated a probable decline in the price of zinc, government stockpiling caused the market to firm; a few months later, the market actually moved up.

Price Unchanged for Entire Year

These factors of tariff, stockpiling and subsidies are noted on the premise that they contribute toward the nature of the market. During 1947, the first full calendar year after the removal of price controls, the zinc market remained unchanged. This was the only year, excluding the wartime controlled market, in which zinc prices did not fluctuate. It would seem inconsistent to say that zinc is a volatile material when the price did not change during an entire year without government price controls; but although the government did not have an iron hand on price control, it had its powers which did not and do not actually allow a "free" market. Volatile markets act primarily through the forces of supply and demand. Government subsidies and stockpiling create these factors in an artificial way.

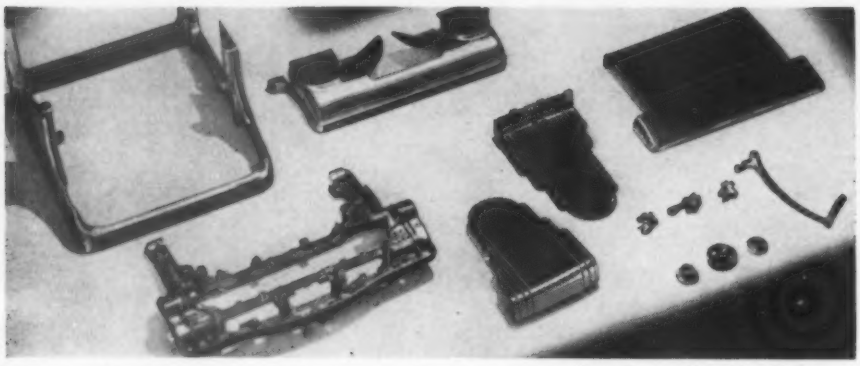
Basing Points. Many alarming interpretations have been voiced concerning the Supreme Court decision on the use of basing point selling practices. The zinc buyer has a stake in possible future developments of this trend and must be prepared to meet the issue squarely. The following section, on "Pricing Zinc Materials" shows the effects of eliminating basing points, because most zinc buying is predicated on an established market. Perhaps a workable system can be devised, but the buyer should watch developments carefully.

Labor. An increasingly important economic influence on the zinc industry, as well as upon other business, is the labor movement. Strikes are constantly a threat to production. This is felt materially in the supply vs. demand factor, which in turn affects the buyer. This paper does not touch upon the causes of these strikes or labor unrest; it only

Checking the gage of rolled zinc strip. Slab zinc rolled into sheet, strip, and plates is made into a variety of products.

•

New Jersey Zinc Co. photograph



New Jersey Zinc Co. photograph

These 13 zinc die castings are used in a well-known typewriter. Consumption of zinc for die casting has quadrupled in 10 years.

suggests to the zinc buyer that it is a problem that is vital to him and one that should be always in his mind. From early July of 1948 through the end of the year, there was a major strike in the industry at one point or another. In July, the zinc price was 12¢ per lb. At the year's end it was 17.5¢ per lb.

Pricing Zinc Materials

There are two methods of pricing zinc and zinc-bearing products. In the finished product group, including spelter, oxides, dust, and chemicals, a published market governs; the market established for spelter influences the others. The establishment of the market has been briefly explained in the foregoing section on custom smelters and primary producers. It should be added here that on a rising market, a period of short supply, the action of one seller will be followed by others to the same extent. This is necessary. They are already hounded by more customers than they can handle. In a declining market, it is necessary to follow suit to meet competition.

In the raw material group, including concentrates and by-products, negotiation on individual contracts and spot sales is the practice. The one notable exception is the sale of concentrates in the Joplin (Missouri) area, where there is a published market for concentrates mined in the district.

Zinc, like copper and lead, has its market points. Through pricing at these points, common to all buyers and sellers in the respective territories, sellers have access to all buyers and buyers are not at the mercy of the closest seller. Since it is necessary for smelters to protect themselves in the market, it is essential that there be a common denominator in the way of price of metal produced from ore purchased. With such published market prices, the smelter can make his purchases against a market that is known to all.

Market prices of zinc are usually figured on the basis of Prime Western grade spelter, f.o.b. East St. Louis, Ill. Although relatively little slab zinc is actually delivered at that point, sales are made for delivery elsewhere and figured back to the East St. Louis basis. Spelter is also quoted on a New York basis, though to a lesser extent, and London is the chief foreign market for quotation purposes. Sales today (December, 1948) for the most part are on the basis of market price at time of delivery, with a stipulation that market price will be determined from tables reported by some specified trade publication.

Other grades of spelter—Brass, Special, Intermediate, High Grade, and Special High Grade—carry premiums over Prime Western of 25¢, 50¢, 75¢, $1.00, and $1.00-$1.25 per cwt., respectively, except that the last two are on a delivered basis. The spread on Special High Grade is brought about by the New Jersey Zinc Company selling at 25¢ under the other producers. These premiums are not necessarily fixed; but generally speaking, they hold rather steady.

Zinc dust and zinc oxide also follow a published market, which is actually a mark-up price from the market of Prime Western spelter.

Zinc-bearing materials, unlike the refined products, are sold on a basis of negotiation—offers, counter-offers, etc., until agreement is reached as to price and method of pricing.

The smelter buying ore finds that East St. Louis, being the primary domestic spelter market, is naturally used as a basis in the purchase of domestic zinc ore. Ore is generally purchased in the open market, either direct from the producers or through metal traders. Because the buyer is interested in the zinc content and the absence of impurities, and because zinc content varies among various lots of ores, a schedule of penalties and premiums is frequently agreed upon. In some cases, a smelter will buy ore outright at the place it is offered, but more often it is purchased on a contractual basis, the price dependent upon the market price of spelter at time the ore is shipped.

Most of the secondary zinc materials, such as ash, dross, sludge, etc., are also sold on the basis of the market price of spelter, but of course at only a percentage of the spelter price. Sal ammoniac skimmings, however, are sold on a fixed price basis per ton, either on a shipping point or delivered basis. This necessitates watchfulness of the quality of material coming from various galvanizers.

The most used method of pricing zinc concentrate sales is to charge a fixed percentage of the zinc content of the ore at spelter market less a treatment charge, which is fixed per ton of ore within certain price limits, charging on an agreed-upon basis when going beyond those limits. An example of this is: "Buyer to pay for 85% of full zinc content of ore at the average price of Prime Western spelter, f.o.b. East St. Louis, as quoted in the *American Metal Market* for month of shipment, less a treatment charge of $35 per dry short ton of ore, when said price is 10.5¢ per lb. For each 1¢ variation in the price of Prime Western spelter from 10.5¢ base, the treatment charge shall be varied by $2.50 per dry short ton of sinter, fractions *pro rata*. Final price determined is f.o.b. smelter."

Upon receipt of such a quotation, the buyer should determine his delivered costs in terms of zinc after conversion to spelter. He must constantly keep in touch with his cost accountants, to know how much margin he must allow if he is to operate at a profit. Different grades of ores will result in different yields; therefore the buyer must

acquaint himself with the operation so that he can use the proper yield factor in his calculations. He must also know whether a given ore is apt to result in a premium grade end product; if so, he will make a greater return and can afford to pay more for the ore.

Because the zinc analysis plays an important role in the final settlement, it is usual practice for buyer and seller to agree to settle on the average of their assays if they are within 0.5% of one another. It is also the custom, if the assays are outside this limit, to send a sample to a mutually satisfactory public chemist as umpire, and the umpire's results are then averaged with the assay closest to his.

It would appear from this example that the determination of price and profit is purely arithmetical, leaving little opportunity for good judgment to play any significant part in a profitable purchase. It should suffice to mention that both buyer and seller will attempt to gain some advantage in the settlement by negotiating a good break in any one or several of the factors. In the price schedule quoted, for example, you will note that the price is based away from the "average price . . . for month of shipment." Some possible modifications of this are "date of arrival", "average of month following month of arrival", "average of week of arrival", etc. During a period of frequent market changes, the period used in price determination will have an important influence on price paid, and this affords the buyer an exceptional opportunity for exercising good judgment.

When making a spot purchase of any of the various by-products, such as dross, ash, residue, or skimmings, a flat price is generally offered either for the commodity or for the zinc content. If the buyer is familiar with the quality of the material, he can safely offer a price on the commodity basis without fear of loss; but when there is any element of question as to the possible zinc content of a shipment, the buyer will offer on the basis of a stipulated percent of the spelter market for the zinc content of the material. In either case, the price would work out the same; but in the latter case, the buyer would have hedged against a possible falling off of quality.

It frequently occurs that in a rising spelter market, the percentage increase in by-product prices will rise at a faster rate than the spelter market, while the opposite condition exists in a falling spelter market. An example will clarify this in the case of dross, using a 10.5¢ spelter price as the base:

Buyer to pay:	When spelter market is:
67%	$ 9.00 to $ 9.49 cwt.
68%	9.50 " 9.99 "
69%	10.00 " 10.49 "
70%	10.50 " 10.99 "
71%	11.00 " 11.49 "
72%	11.50 " 11.99 "
73%	12.00 and over

To explain the implications of this schedule, a few calculations should be made. The 67% price means that, if spelter is selling at $9 per cwt., or $180 per net ton, the dross price will be 67% of $180, or $120.60 per net ton. The difference, $59.40 per ton, is the operating cost to seller for unused zinc, and the margin for freight, conversion and selling costs, and profit for the buyer. The 73% price applies if spelter sells at $12 per cwt., or $240 per ton; 73% of this figure is $175.20, so the margin will be $64.80, calculated as above. If the percentage allowed the seller did not increase with the market, his by-product losses would become unbearable. A constant 67% price would cause his costs for unused zinc to increase from $59.40 to $79.20.

The method used in pricing dross does not result in a reduction of dollar profit to the buyer. As shown in this example, increasing the percentage from 67% to 73% resulted in increasing the margin from $59.40 to $64.80. This is the extent of loss to the seller and available margin to the buyer to cover other costs and profit. Of course, the percentage cannot continue too high, or eventually it would close out any possibility of profit to the buyer.

Working on a close margin, the buyer of dross must guard against low yields. Dross fines will not give as high zinc yields as slabs when making zinc dust. When using fines, the burning surface is so

High purity slab zinc for zinc alloys, known commercially as Special High Grade, is produced in special furnaces.

●

New Jersey Zinc Co. photograph

greatly increased that a considerable reduction of yield results from gaseous losses. For this reason, the buyer will try to penalize the seller for fines contained in a shipment.

Purchase Agreements

When buying regular commercial zinc products, agreements are not unlike most other purchase agreements. Quality is protected by specification; price is either firm or that in effect at time of shipment; terms are usually net cash 30 days from date of shipment.

By-product purchasing is a little different. The agreements are usually very simple documents. Quality is generally stated as "same as previously shipped" or "same as sample submitted". Terms are frequently stated as "net cash upon determination of buyer's weights and assays". Quantity, if a spot purchase, is usually definite; if under contract, it is almost invariably indefinite, such as "seller's output", or "seller's output, but not to exceed (definite quantity) per month." Variables in price have already been noted.

Many factors are covered in agreements for the purchase of zinc concentrates. Approximate analysis is often shown, with penalties and premiums allowed for variances. More often than not, the quantity and period covered are definite. The variables making up the price determination are always specifically covered, as are the rate and methods of shipment. Method and responsibility for unloading, weighing, and assaying are almost always a "must". It is not unusual to include clauses giving the buyer or seller the privilege of canceling under certain conditions. The effect of tax increases or import duties is usually spelled out, and a clause is generally included to show the extent to which the buyer will make advance payments upon receipt of material, pending final determination of weights and assays.

Zinc Buyer's Tools

Except in the form of spelter, zinc materials are generally sold quickly when available. Since there are so many variables with respect to analysis for moisture, zinc, iron, lead, chlorine, and impurities, and none of these materials are sold to specifications, the buyer must have sufficiently good records to make a spot decision while limiting the degree of speculation as to quality.

For example, a zinc material with more than 0.75% chlorine may not be acceptable for lithopone, but would be good for zinc chloride. An ore with over 2% lead might be objectionable for spelter, because it could produce a low-grade metal and preclude the possibility of selling a premium grade. An ore with high lime content may cause fluxing in the retorts, resulting in high repair costs. A galvanizer using aluminum in his hot dip baths to brighten the finish of his product would accumulate a skimming that results in filtering trouble when producing zinc sulphate.

Aside from the danger of buying a wrong material, there is the need to know if and how the material is changing in quality. With high zinc costs, many galvanizers will look for methods to decrease their zinc losses, thus lowering the value of by-products to the consumer.

If the buyer must deal with many sources of supply for zinc concentrates and other zinc-bearing materials, he cannot trust memory to record the experience of chemical properties of various shipments. He must set up a record system, so that he will know at all times the pertinent information regarding the various materials he has received and is likely to buy.

Freight is an important factor, there being cases where freight cost exceeds the material cost. A good zinc buyer will, therefore, always have a current list of freight rates from all probable shipping points.

The nature of zinc buying requires constant knowledge of inventory position and production forecasts. Many materials are offered for immediate acceptance or rejection. Since these offers are sometimes made by telephone, and require a decision at the same moment, the buyer must know at once whether he has room to store the material and if the purchase would be consistent with his inventory policy at the time.

Contemplated substitutions of zinc for other metals, or *vice versa*, is always an important subject to follow. To analyze such cases properly, the zinc buyer must follow the supply and price picture of possible substitutes almost as closely as the zinc market itself.

Weather has a tremendous influence on the availability of zinc in all its forms. A warm winter would increase zinc output in Canada, while a cold winter in South America would decrease the amount of concentrate exported to this country. Naturally, any unusual increase or decrease will affect the price of a volatile item. Therefore the buyer should have weather information coming to him, that he can better forecast future supply.

An alert zinc buyer will not let foreign industrial, economic, and political conditions go unnoticed. Dollar exchange, tax policies, railroad facilities (mine to seaport), and political movements, among other factors, all influence the availability and the price of zinc.

As in dealing with any other material, reading of publications and constant association with persons in the trade are necessary to maintain a full knowledge of the subject and to keep abreast of and to forecast changing conditions. This should not be limited to the zinc industry alone, but should include all those businesses which affect or are affected by the zinc industry to any important extent.

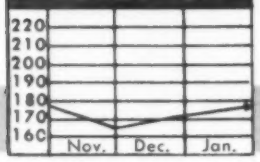
It can easily be concluded from the foregoing that the most important tool for the competent zinc buyer is a studious mind. He must constantly be seeking further knowledge, and piece all bits of information into a useful pattern. He must not be satisfied with just the factors touching the main product, spelter. He must be concerned with all zinc products and the activity of zinc-consuming industries. He must be forever watchful of current business indices and all the artificial economic pressures brought about by governments, here and abroad. He must remember that some current development may have its effect on the market at some later date, and not wait to evaluate the incident until the effects are upon him.

For the most part, this same treatise could have been written thirty years ago. Because of accelerated technological progress and unpredictable changes in the artificial factors of regulation, the author predicts that within five years it will be of value chiefly as history. But the buyer who heeds the concluding section and keeps in step with the changing scene will have new and current data on "How to buy zinc."

Where We Stand

Today's Business Trends As Reported In Current Statistics

PRODUCTION

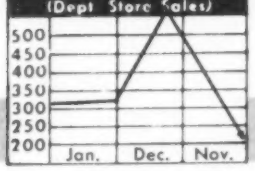


	BASE	LATEST	MONTH AGO	YEAR AGO	% OF CHANGE IN MONTH	% OF CHANGE IN YEAR
Industrial Production Index	1935-39=100	177 (est.)	171	192	+ 3.5	— 7.8
Steel Production (Weekly)	000 net tons	1,810	1,735	1,845	+ 4.3	— 1.9
Electric Power Production (Weekly)	mil KWH	5,695	5,743	5,742	— 0.8	— 0.8
Bituminous Coal Production (Weekly)	000 net tons	5,630	9,260	11,585	—39.2	—51.4
Auto, Truck & Bus Output (Weekly)	units	118,588	66,559	81,968	+78.1	+44.7
Petroleum Output (Weekly)	000 bbls.	4,865	5,045	5,454	— 3.7	—10.8
Engineering Construction (Weekly)	000 $	184,814	207,441	127,101	—10.9	+45.4

PRICES

	BASE	LATEST	MONTH AGO	YEAR AGO	% OF CHANGE IN MONTH	% OF CHANGE IN YEAR
All Commodities (BLS)	1926=100	151.2	151.1	161.3	+ 0.1	— 6.3
Farm Products	1926=100	154.6	154.2	175.8	+ 0.3	—12.1
Metals & Metal Products	1926=100	169.5	168.7	175.6	+ 0.5	— 3.5
Building Materials	1926=100	190.3	189.8	202.5	+ 0.3	— 6.0
Steel Billets (Pittsburgh)	net ton	$54.00	$52.00	$52.00	+ 3.8	+ 3.8
Steel Scrap, heavy melting, Pitts.	ton	29.75	31.75	40.75	— 6.3	—27.0
Copper, electrolytic	lb.	.18½	.18½	.23½	0	—21.3
Cotton, mid. 15/16"	lb.	.3174	.3083	.3325	+ 3.0	— 4.5
Rubber (Rib-smoked sheets)	lb.	.18¼	.17¾	.19¾	+ 2.8	— 7.6
Wheat, No. 2	bu.	2.50⅜	2.54	2.54	— 1.4	— 1.4

TRADE (Dept. Store Sales)



	BASE	LATEST	MONTH AGO	YEAR AGO	% OF CHANGE IN MONTH	% OF CHANGE IN YEAR
Dept. Store Sales Index (Fed. Res.)	1935-39=100	205	584	576	—64.9	—64.4
Commercial Failures (Dun & Bradstreet)	no.	207	221	127	— 6.3	+63.0
Freight Carloadings	cars	506,947	693,923	721,507	—26.9	—29.7

FINANCE

Stock Prices (Standard & Poor's)	1926=100	133.1	130.4	122.8	+ 2.0	+ 8.4
Bank Clearings (New York)	mil $	7,319	7,274	6,812	+ 0.6	+ 7.4
Federal Reserve Credit	mil $	18,644	18,628	23,193	+ 0.1	—19.6
Currency in Circulation	mil $	27,311	27,699	27,919	— 1.4	— 2.1

MANUFACTURERS' SALES, AND INVENTORIES

Value of Manufacturers' Sales
Seasonally Adjusted
(Millions of Dollars)

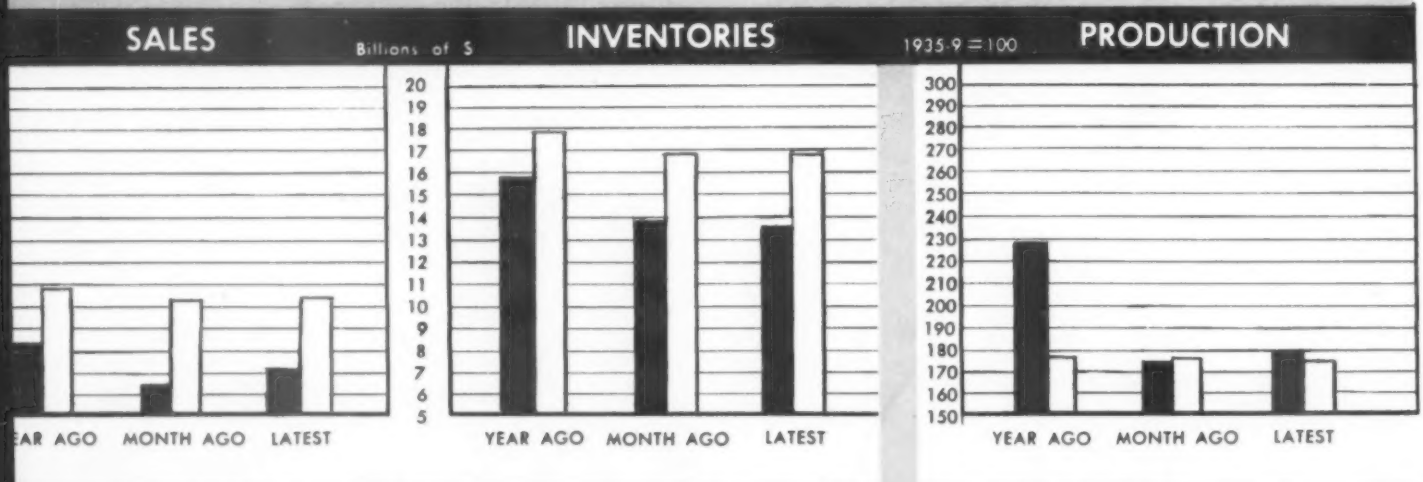
	1948	1949					
	Nov.	June	July	August	Sept.	Oct. (r)	Nov. (p)
All Manufacturing	19,288	17,990	17,114	18,945	18,866	16,824	17,597
Durable goods	8,369	7,745	7,207	7,982	7,878	6,561	7,233
Iron and Steel	2,203	1,811	1,703	1,850	1,895	1,108	1,619
Nonferrous metals	644	512	418	546	579	500	506
Electrical machinery	837	730	669	749	802	756	756
General machinery (exc. elec.)	1,298	1,195	1,063	1,130	1,130	1,053	1,101
Motor vehicles & equipment	1,232	1,553	1,558	1,739	1,579	1,371	1,248
Transportation equipment (exc. motor vehicles)	476	454	487	492	365	359	451
Lumber and timber products	460	417	362	410	436	409	453
Furniture & finished lumber products	406	339	288	336	346	324	339
Stone, clay & glass products	397	369	349	395	388	354	399
Miscellaneous durable goods	416	366	310	335	358	327	361
Nondurable goods	10,919	10,244	9,907	10,964	10,988	10,263	10,364
Food and kindred products	3,029	3,006	2,774	2,969	2,989	2,890	2,815
Beverages	514	701	674	740	589	528	484
Tobacco products	292	279	271	298	285	256	280
Textile-mill products	1,170	984	968	1,111	1,164	1,089	1,163
Apparel	1,009	685	770	995	964	791	699
Leather and products	277	303	282	316	294	274	258
Paper and allied products	551	461	497	583	644	623	616
Printing and publishing	528	592	555	573	596	509	519
Chemicals and allied products	1,205	1,143	1,106	239	1,274	1,174	1,195
Petroleum and coal products	1,735	1,525	1,511	1,598	1,618	1,575	1,714
Rubber products	291	266	271	295	277	262	n.a.
Miscellaneous nondurable goods	318	300	227	245	294	291	334

Book Value of Manufacturers' Inventories
Seasonally Adjusted
(Millions of Dollars)

All Manufacturing	33,810	33,250	32,367	31,638	31,059	30,737	30,616
Durable goods	15,895	15,727	15,225	14,741	14,266	13,870	13,611
Iron and steel	3,484	3,564	3,459	3,337	3,185	3,055	3,028
Nonferrous metals	1,045	1,136	1,115	1,064	1,035	1,023	1,024
Electrical machinery	1,999	1,888	1,806	1,737	1,648	1,603	1,573
General machinery (exc. elec.)	3,564	3,484	3,386	3,329	3,239	3,152	3,075
Motor vehicles & equipment	2,054	1,977	1,904	1,824	1,769	1,678	1,599
Transportation equip. (except motor vehicles)	980	915	903	860	869	839	826
Lumber and timber products	664	652	617	586	558	598	602
Furniture & finished lumber products	761	786	757	754	744	717	724
Stone, clay & glass products	560	563	548	527	506	492	476
Miscellaneous durable goods	784	762	731	724	712	712	685
Nondurable goods	17,916	17,524	17,142	16,898	16,794	16,867	17,006
Food and kindred products	3,029	3,026	2,842	2,884	2,806	2,955	3,029
Beverages	1,059	1,095	1,102	1,062	1,124	1,099	1,112
Tobacco products	1,631	1,633	1,611	1,668	1,728	1,715	1,706
Textile-mill products	2,448	2,361	2,316	2,219	2,198	2,218	2,247
Apparel	1,588	1,412	1,421	1,359	1,332	1,332	1,357
Leather and products	616	624	590	598	614	611	631
Paper and allied products	887	872	832	793	756	739	735
Printing and publishing	629	609	580	568	561	559	568
Chemicals & allied products	2,445	2,278	2,264	2,247	2,228	2,222	2,224
Petroleum and coal products	2,408	2,544	2,546	2,513	2,497	2,507	2,508
Rubber products	667	644	625	586	562	537	n.a.
Miscellaneous nondurable goods	510	427	415	401	390	373	357

n.a. — not available (r) — revised (p) — Preliminary

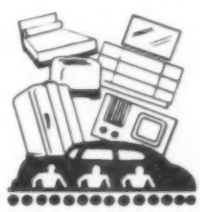
SALES, INVENTORIES AND INDUSTRIAL PRODUCTION



Straws in the Trade Wind

● United States exports in 1950 will decline to a total of $11,000,000,000, according to an estimate made recently by John F. McKiernan, director of the New York regional office of the Department of Commerce. Exports in 1949 totaled approximately $12,000,000,000. Mr. McKiernan said imports were expected to rise to about $7,000,000,000 as compared to the 1949 figure of $6,000,000,000.

● Total business inventories at the end of November were estimated at $55,200,000,000 by the Office of Business Economics, Department of Commerce. After adjustment for seasonal variations, the book value of inventories was about $300,000,000 below the October level. The decrease was concentrated in retailers' and manufacturers' stocks.



● The annual potential steelmaking capacity of this country is now 99,392,800 net tons of ingots and steel for castings, according to the American Iron and Steel Institute. Capacity was increased 3,271,870 tons during 1949. Current capacity, which sets a new record, is about 4,000,000 tons above that established during the war. It is about 11,000,000,000 tons above the combined output of all the rest of the world last year.

● The Department of Commerce has predicted that factory sales of motor vehicles in 1950 will be between 5,000,000 and 5,500,000 units, a decrease of 10 to 20 per cent below 1949. Production, however, will be about equal to 1929 and 1948, the only other years when the 5,000,000 figure was reached, the department said. It also predicted that 1950 will be a good year for most industries making machinery and transportation equipment, although output will be "somewhat below 1949".

● Plans for the erection of a production foundry and motor plant in the Cleveland, O. area have been announced by the Ford Motor Company. The company says that the new installation will eventually employ 10,000 people. The plant is intended to increase the company's production and will not affect employment at Dearborn, Mich.

● Chemists and engineers of Shell Oil Company have succeeded in making an automobile travel 150 miles on a gallon of gasoline, it was revealed at the recent convention of the Society of Automotive Engineers. The feat was accomplished by making adjustments and mechanical changes in the car, putting 110 pounds of pressure in the tires, and coasting the car after shutting off the motor when 20 m.p.h. speed had been reached. The S.A.E. members were told that the chief value of the experiments was in developing new means of fuel economy, and in leading to improvements in future automobiles.

● A new corporation that will market and distribute titanium has been formed with joint ownership by National Lead Company and Allegheny Ludlum Steel Corporation. The company, called the Titanium Metals Corporation, will have headquarters in New York, N. Y. The metal, relatively new, is extremely strong, resistant to acid and non-corrosive, and is considered to have great potentialities for industrial use.

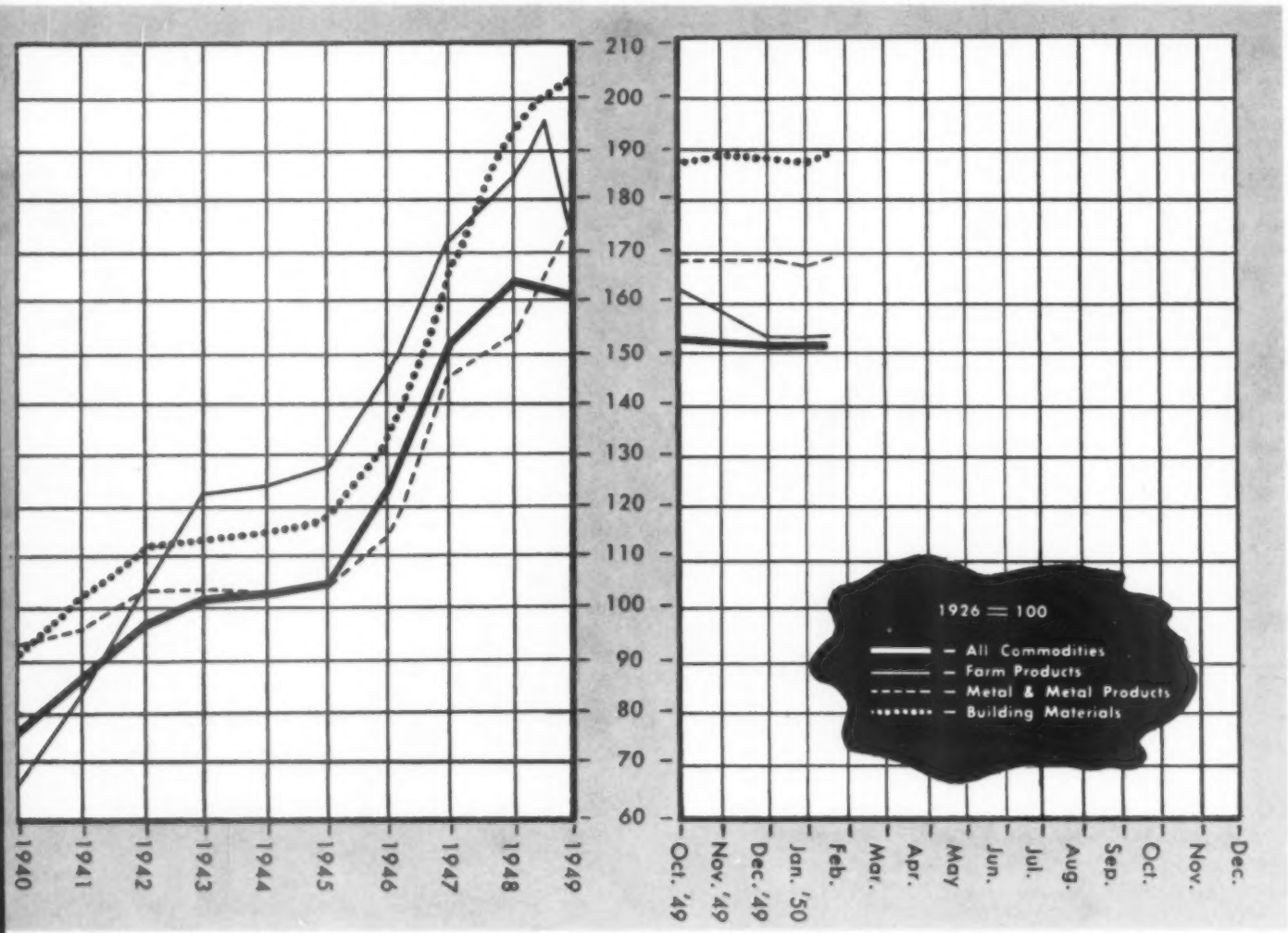
● The National Bureau of Standards has developed a synthetic mica that "has essentially the same properties as natural mica, but is superior to the natural substances in its ability to withstand high temperatures," according to Secretary of Commerce Sawyer. This country is now the world's largest consumer of mica, but produces only enough to meet a fraction of its requirements.

● Total receipts for all tax-exempt organizations approached $10,000,000,000, according to a tabulation of latest available data (1946) just completed by the National Industrial Conference Board. About 28,000, or 28 per cent, of all the tax-exempt organizations were engaged primarily or exclusively in business activities in 1946. Typical of such organizations, according to N.I.C.B., are farmers' marketing cooperatives and mutual savings banks.

● General Motors "1949 profits are likely to move up to over $600,000,000", highest in the corporation's history, according to Alfred P. Sloan, Jr., chairman of the board. GM profits for the first three quarters totaled $400,000,000.

● Business loans during the week ended January 11 climbed $6,000,000 to a total of $13,857,000,000, according to the Federal Reserve Board. The total, however, was $1,558,000,000 below the same time a year ago.

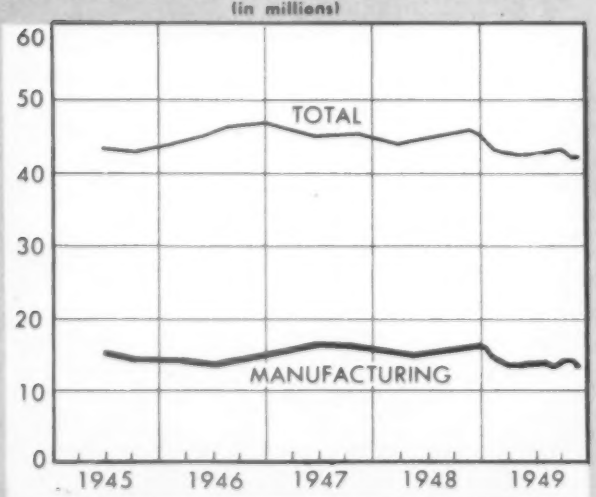
The Price Picture



Employment & Earnings

NON-AGRICULTURAL EMPLOYMENT

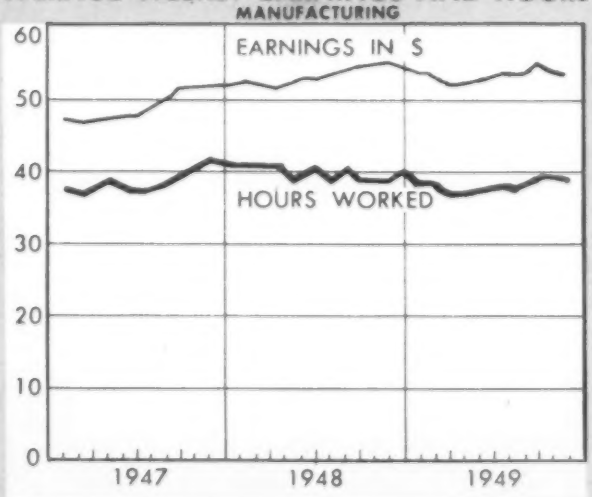
(in millions)



SOURCE: U.S. DEPT. OF LABOR

AVERAGE WEEKLY EARNINGS AND HOURS

MANUFACTURING



The Pulse of Business

The old year went out in handsome style, business-wise, and the new year bustled in showing great promise. There is plenty of opinion around to the effect that this burst of activity is merely evidence of an "early foot" that will slacken considerably as the year's race grows longer. But there are even more to whom it is an impressive and encouraging performance that should stand up at least until midyear, and then slow down only gradually.

The dominant factor in the picture is the ability and willingness of consumers to continue buying goods. Retail sales boomed during December, and the post-Christmas close-outs and heavy markdowns were not as widespread as in some previous years. Retailers began the year with "clean" shelves, and generally expect that their business in 1950 will just about measure up to that of 1949. A survey of 250 of the country's largest stores, doing an annual business of about $2,000,000,000 revealed such expectation during the recent National Retail Dry Goods Association convention. General Motors executives, and other representatives of the automobile industry, have expressed confidence for the coming year, even though it is not expected that output will match the all-time record established last year. Housing construction, another record-smasher in 1949 will fall only slightly short of that record in 1950, according to predictions, thereby providing a continuing stimulus to related industries.

The bounce back after the fall strikes in coal and steel, therefore, appears now to many observers to be more than just the result of a rush to replenish inventories. It seems to be based on solid demand, backed up by the money to pay for goods. How long that demand will keep up, or can be kept up, is the question. Some feel, looking back on previous periods in our history, that eventually the pipelines will fill up, production will pass consumption, and the economic machinery will begin to creak here and there.

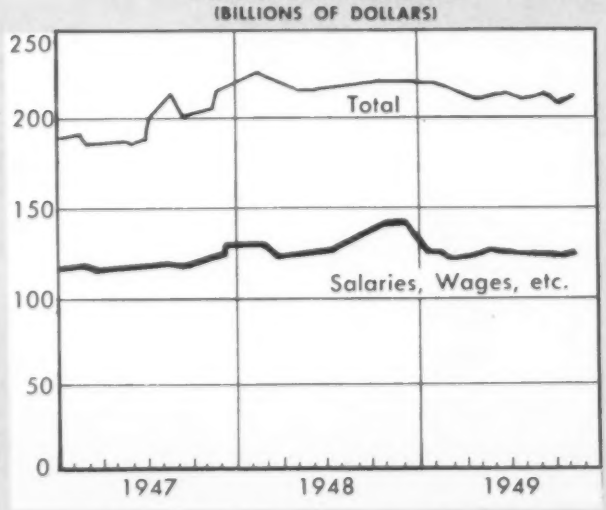
There are some factors that give support to that point of view. Expenditures for new plant and equipment declined in 1949 and are expected to continue that downward trend in 1950. A drop of at least $1,000,000,000 in exports is seen for this year. Farm income may go down at least 10% in the opinion of government experts.

On the other hand, a relatively new and more optimistic long-range view is finding favor with a number of economists. It sees the economy now running at a high and comparatively stabilized level, with business generally better aware of the pitfalls of former years and the methods to avoid them. It holds that by planning intelligently and maintaining flexibility to meet changing conditions, particularly the growing population, the business man can keep up his profit and the consumer his standard of living at about present levels. As Q. Forrest Walker, economist for R. H. Macy & Co., put it recently: "If we look ahead to the minimum requirements of our population in the next five or ten years, there is little reason to be gloomy about the prospects of doing a much greater volume of business on a lower price level and at an adequate profit."

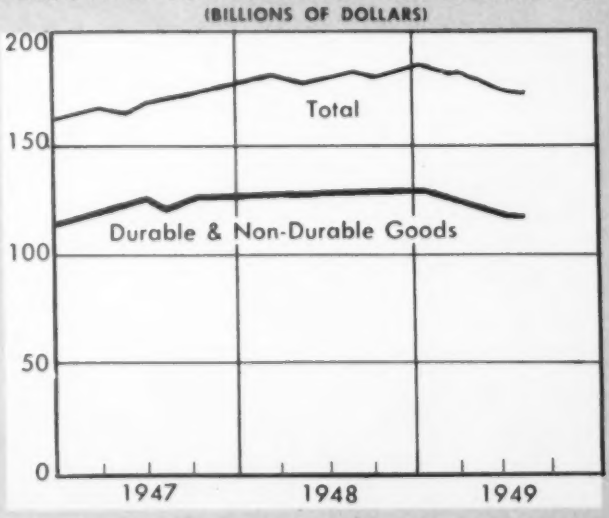
The President's optimism outdid all others in his annual report to Congress, and he projected rosy possibilities for all as far as the year 2000. Even the most sanguine of orthodox economists, however, were disinclined to look that distance without a multitude of qualifications. In fact, many were insistent that we concentrate on very immediate problems, such as reduction of the public debt, revisions of the tax laws, and a little more caution in seeking the welfare state without regard to the cost involved. But the plans outlined by the administration offered them small comfort. Deficit financing is necessary and will be continued, the President said, and there will be no let up in Fair Deal efforts to establish its social program. The President's tax message had not been given at this writing, but all indications were that it would call for a $1,000,000,000 increase in Federal revenue through increased corporation and gift taxes, although reductions in excise taxes would be included.

Personal Income & Expenditures

PERSONAL INCOME
(BILLIONS OF DOLLARS)



PERSONAL CONSUMPTION EXPENDITURES
(BILLIONS OF DOLLARS)



Materials & Markets

STEEL

Steel operations continued strong during the month and it is generally held that the heavy demand now existing is something more than a violent but short-lived reaction to the strike. Production reached a nine-month peak at mid-month, and was announced as 98.2% of capacity by the American Iron and Steel Institute. These figures were later revised downward to 95% when it was revealed that the industry's capacity had been increased by 3,271,870 tons in 1949. Tonnage scheduled for the week ending January 20 was 1,810,300, as compared with 1,845,400 tons in the comparable period last year.

Although the current high rate is not expected to be maintained beyond the first quarter, it is felt in the trade that it will still be substantial, as orders continue to pile in. Flat rolled steel appeared to be in heaviest demand, with little likelihood of a let up for at least sixty days. Reports from Chicago indicated that sheets were on allocation, and demand for them everywhere was good. Hot and cold rolled bars, structural shapes, and plates, tinplate, and stainless steels, were also reported in good demand, with tightness varying as to locality of users.

As conditions in the coal strike became more chaotic, steel operations were affected, although to this point there appeared to be little fear that production would be stalled by lack of coal. Most mills are believed to be well stocked with coal as a result of foresighted stockpiling policies, based on previous experience with the policies of Mr. Lewis. Nonetheless, there were scattered reports of cutbacks owing to the coal shortage, and in the face of the big demand for steel it would seem that some consumers will suffer, at least temporarily.

Although the steel business is good, the recent price rise to date has had little effect on prices of finished products. Indeed, small reductions in the price of automobiles, one of the principal consumers of steel, have appeared since the new prices were announced. There has been considerable talk of a softening in fabricated steel items, and one large New York buyer has stated that he has had quotations running from 10 to 15% below those of last year. General opinion on the results of the steel increase was probably summed up best in the comment of the N.A.P.A. Business Survey Committee: "While purchasing agents realize the steel increase will spread into the cost of many fabricated items, competition is expected to hold the over-all effect to a minimum. The action in steel is not expected to become a starting point for inflation." This situation, plus the fact that the steel companies are said to be well supplied with figures to back up their action, is expected to put the industry in a strong position when a Congressional committee starts its investigation of the price increase.

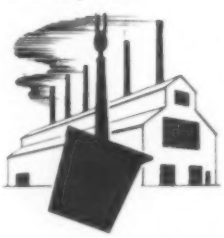
NON-FERROUS METALS

Copper demand continued strong throughout the month and is expected to be maintained at least for another month. Statistics from the Copper Institute revealed that deliveries of refined metal to consumers in this country in December totaled 107,662 tons. Production rose strongly in December to 71,491 tons, the highest since early spring. Refined stocks at the end of the period dropped to 116,027 tons. During July and August, stocks were well over 200,000 tons. It is expected that deliveries for January will reach about 110,000 tons.

Although copper appears in a strong position, there are restraining factors that may indicate some weakening in later months. The present time is normally a period of strong buying in anticipation of the spring season. Also, production is rising owing to the return of the mines to a 48-hour week. Added up it would appear that the price situation is not headed upward at the present time.

The split price condition that had existed in the zinc market for several weeks—offerings were being made at both 10¢ and 9¾ ¢ a pound—seemed to have been resolved in favor of the lower figure toward the end of the month. Demand is still good, but some hesitancy on the part of buyers was reported based on fears of a reduction in galvanizing if the coal strike adversely affected steel operations. Deliveries of slab zinc to consumers in United States in 1949 reached the lowest point since 1940—648,361 tons. Stocks in the hands of producers at the year end totaled 93,964 tons, an increase of about 4,000 tons from the end of November. Stocks in the hands of producers at the end of 1948 totaled 20,848 tons.

The Reconstruction Finance Corporation, through its Tin Sales Corp. announced a ½ ¢ reduction in the price of Grade A tin early in the month, bringing it to 77¢. A few days later another cut brought it to 76¼ ¢. This was said to have been under pressure of increasing foreign supplies. There are more than ample supplies of tin now available to meet current demand, it is reported.

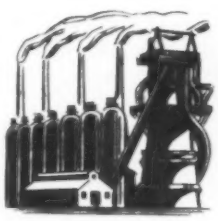


A big decline in the shipment of replacement batteries has darkened the lead picture from the producers' point of view. Unseasonably warm weather has kept shipments down considerably from what is judged as "normal" and apparently there is little chance for a comeback in that area, inasmuch as winter is now about half over. Shipments for 1949 were 18,541,000 units as compared

with 23,717,000 in 1948. Imports continue to make their presence felt, and tend to keep the price at a relatively low level of 12¢ a pound. Trading in lead futures was resumed on the floor of the Commodity Exchange, New York City on January 17, and resulted in a good deal of activity. At the time trading was halted in 1942, bids were at 5.92¢ a pound. The opening bid on January 17 was 11.65¢ a pound.

Non-ferrous circles noted with interest that President Truman in his annual budget message called for additional funds for stockpile purchases of metals by the Government during 1950. That would bring the total available for purchases of metals and strategic materials to $1,100,000,000.

FUELS



With the prospect of a severe winter of any sizable duration diminishing as the weeks go by, there is little expectation that demand for petroleum products will disrupt the "more than adequate" supply situation that now exists. Uncertainty over the coal strike, however, has led to greater demand for some products, notably residual fuel oil. According to the Bureau of Mines, demand for all oils in the last quarter of 1949 may have been 1% off the forecast made in November, and demand for distillates may be off about 7% because of mild weather.

The controversy over crude oil imports resulted in two rather significant developments during the month. On January 16, Representative Ed Gossett, Democrat, of Texas, introduced a bill calling for a 400% rise in the excise tax on petroleum imports. That would raise the levy to one dollar a barrel. "Our domestic oil is being supplanted by foreign oil that comes in relatively tax free", Gossett said. "American refineries are being closed by the dozen." On January 20, the Texas Company announced that it was reducing, as of February 1, its foreign oil imports by almost 18%. The company had planned imports of 72,425 barrels of foreign crude and 7,600 barrels of residual fuel oil daily. The new figures will be 62,250 barrels of crude and 3,500 barrels of residual.

Continued decline in domestic demand for crude oil resulted in a cut of 36,225 barrels daily in Texas February crude allowable, according to an announcement by the Texas Railroad Commission, the regulatory body. This was the tenth cutback since December, 1948.

The troubled coal situation appeared to be getting worse as this was written, but some persons were inclined to see a ray of hope in the fact that the miners were beginning to "disobey" John L. Lewis, even if they had to use a 5-day strike to show it. Thousands of miners in the rich soft coal regions of Pennsylvania refused to go back to work on January 23, in defiance of the "suggestion" of Lewis that they return to the pits. It appeared at that time to U.M.W. officials that a majority of the 90,000 workers on strike in seven states will stay out, until they know whether they are "on foot or on horseback". Meanwhile there were demands that the President intervene on the grounds that a national emergency exists, and it was announced that Robert N. Denham, general counsel of the National Labor Relations Board would seek an injunction enjoining Lewis and the U.M.W. President Truman again stated that there is no national emergency which would warrant invoking the Taft-Hartley Law.

A nationwide study of railroad, industrial, utility, retail yard and domestic stocks of bituminous coal, made by Joseph E. Moody, president, Southern Coal Producers Association, showed that stockpiles by the end of January would be at their lowest peak in 15 years, according to the American Coal Sales Association. He estimated that stocks at the end of January would be approximately 23,202,000 tons. In only one other month, says the association, did stockpiles drop under the 25,000,000 ton mark. That was June, 1933, when they went down to 24,000,000 tons.

One dramatic example of how the strike's effects can reach deeply into the industrial system was offered by the announcement of the Duquesne Light Company of Pittsburgh that it was planning to curtail its production of power in order to stretch its present supplies of coal. The company serves some of the nation's leading industrial plants in that area, and one, the United States Steel Corporation said that it would shut down four electric furnaces at its Duquesne works and five rolling mills in Pittsburgh, as a result of the reduction in power.

MISCELLANEOUS

Paper production has resumed at a high rate following the customary Christmas season shut-downs. Demand is still good, and prices are expected to remain firm for the immediate future . . . President Truman has asked Congress to extend government control over the synthetic rubber industry for the next ten years. He called for maintenance of existing plant capacity of nearly 1,000,000 tons a year either in operation or stand-by condition. Meanwhile British natural rubber producers have begun a large campaign to popularize natural rubber, and make it better. In advertisements appearing in American papers, the group said "natural rubber is now selling at pre-war prices. Its production and price are unrestricted and unsubsidized."

LUMBER MARKET APPEARS FIRM FOR FIRST HALF

With current demand at a somewhat higher than seasonal rate, owing to the mild weather, and prospects of good business and construction activity for the next few months, the lumber market appears quite firm for the first half of the year.

Production is high and the pressure on prices is gently upward, although there is no expectation of a runaway climb, or more than temporary shortages in some items. Further, scattered reports of weaknesses in the market, indicate that the current condition is not permanent and can change considerably once the spring building boom is spent.

The factors that carried the lumber industry out its 1949 second-quarter slump are still effective and will probably continue so into 1950, with a gradual decline setting in toward the fourth quarter. Housing construction took a tremendous spurt in the latter half of last year, and finally broke all records. Furniture sales showed great strength after the spring "recession" and carried on well into December. With these two outstanding stimulants, lumber production, and prices, began moving up. Prices, which had experienced a 13-month gradual slide, started climbing in late August and early September and have continued that movement, although gradually. On the average, there was a 5.4% drop in overall lumber prices in 1949.

Estimates made by both government officials and industry leaders indicate that 1950 will be another good housing year, although the overall drop from 1949 should be about 10%. A similar outlook has been painted for the furniture business. It is reasonable to assume that much of that building will be concentrated in the traditional spring season with a tightening effect on both supply and prices. Retail yards have begun heavier ordering, which is reflected in reports from mills, both western and southern that backlogs are increasing rapidly. The optimism expressed at the recent furniture show should also act as a stimulus to purchases of special items used in that industry. The period of "watchful waiting" by both buyers and sellers, which is apparently traditional in the lumber industry, is now over.

Because of the heavy influx of orders, it is reported, buyers cannot get everything they want and some items are being temporarily allocated by various mills. One of the outstanding of such items 5/4 Western pine, which is in great demand, particularly for use in home construction. Plywood is in exceptionally heavy demand, and 60 to 120 day shipments from western mills have been reported. Plywood producers have done a big job in promoting the product and it is now being widely used in applications heretofore considered impractical. It is becoming increasingly popular, for instance, as underflooring and sheathing, both for its quality and efficiency, and for the great labor-saving that results. It too, has risen in price up to 10% in recent months, and further small increases are considered likely during the spring.

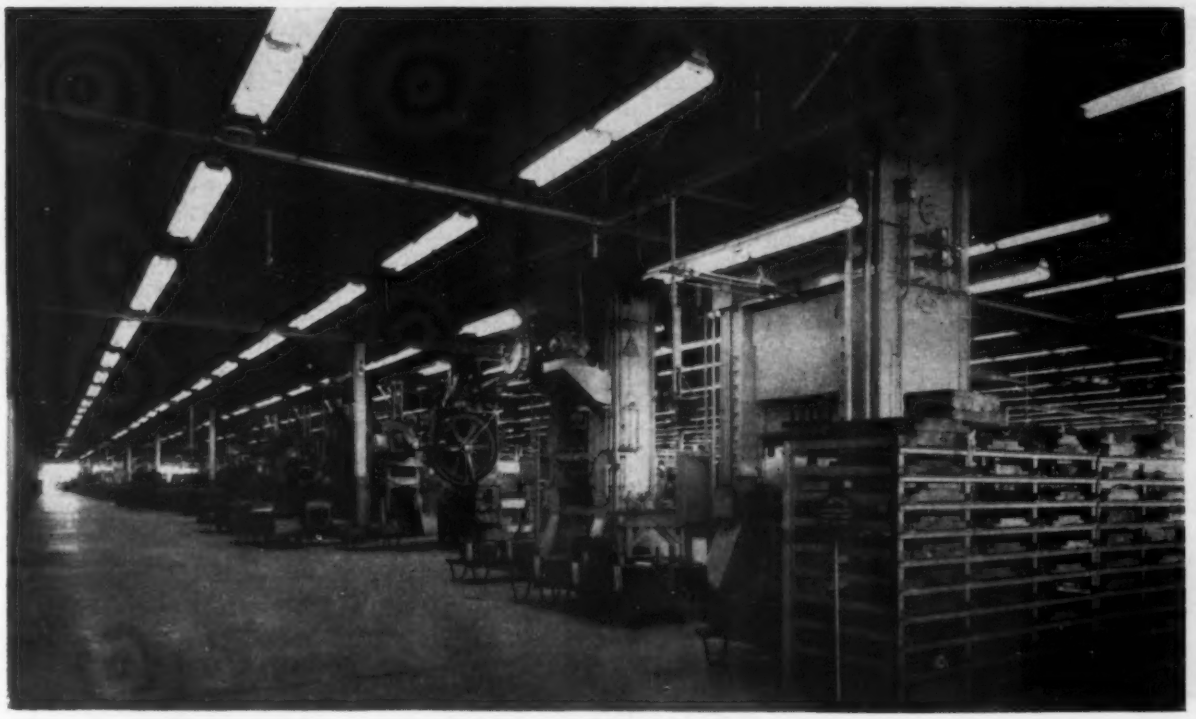
While the general picture is one of high demand, and strong price situation, there is a feeling in some quarters that soft spots here and there indicate future weakness. It is believed, by some observers, that the actual basic supply is more than plentiful, but that "accidental" factors have helped create the current tightness. An unusual situation existed this winter, it has been pointed out, when bad weather in the West slowed production and shipping, and mild weather in other parts of the country spurred construction and boosted demand. An interesting observation was made recently by Roy Wenzlick, building and real estate analyst at the Northeastern Retail Lumbermen's Association. Commenting on the 1949 drop in prices he said, "the situation is a little bit more drastic than that, and some dealers tell me that there is a lot of lumber being hauled in by truck and sold to customers at less than wholesale prices". The future trend of prices for 1950, he added, will be "side ways for the next six months, then starting downward again". The term "side ways" would be disputed by some dealers who have just been notified by one large producer that all prices have been withdrawn—always a clear indication of a coming rise—but they would be less inclined to argue about the second half prospects.

ESTIMATES OF NATIONAL LUMBER CONSUMPTION

(in board feet)

	1st SIX MONTHS	2nd SIX MONTHS	TOTAL YEAR
1931-1940 (Average)			17,595,000,000
1943	18,896,000,000	18,564,000,000	37,260,000,000
1944	17,777,000,000	16,595,000,000	34,372,000,000
1945	17,044,000,000	14,501,000,000	31,545,000,000
1946	16,824,000,000	16,721,000,000	33,545,000,000
1947	16,129,000,000	18,769,000,000	34,898,000,000
1948	17,633,000,000	18,306,000,000	35,939,000,000
1949	15,185,000,000	17,425,000,000*	

Source-Lumber Survey Committee report to Secretary of Commerce
*Tentative estimate made in November, 1949



More than 7½ miles of fluorescent lights have been installed in the new A. B. Dick Company plant at Niles, Ill.

How to Buy a Lighting System

Proper selection involves comparison of lighting qualities and of costs

Basic information required by bidder for recommending adequate installation

Typical cost analysis for comparing five proposed lighting systems

●

By Davis H. Tuck
Electrical Engineer

THE lighting for a manufacturing plant can usually be divided into four general classes as follows:

1. Lighting for manufacturing areas.
2. Office and drafting room lighting.
3. Outdoor lighting.
4. Special purpose lighting—such as instrument control boards, bulletin boards, cafeterias, directors' room, etc.

There are several methods of lighting each of these various classifications, all of which will give satisfactory results. For instance, a chipping dock in a steel mill may be lighted with incandescent lamps, mercury lamps, a combination of incandescent and mercury lamps, or with fluorescent lamps. The lighting equipment may be alzac aluminum, prismatic glass, or porcelain enameled steel. Or, for office lighting, the possibilities are still more varied such as a direct lighting, indirect lighting, or semi-indirect lighting utilizing either incandescent or fluorescent lamps in fixtures made of prismatic glass, alzac aluminum, porcelain enameled steel, or plastic.

Before any intelligent selection can be made from such a variety of lighting systems they must, naturally, be reduced to a common denominator. This common denominator is illumination (footcandles) on the work.

It is suggested that your engineer furnish you with a lighting specification as follows:

1. Footcandles in service.
2. Current cost—cents per kw. hr.
3. Burning hours per year.
4. Burning hours between turning lamps on and off.

You will then send this specification with plans and elevations out to at least three reputable manufacturers of industrial lighting equipment and ask them for a lighting layout to meet your engineers' specifications together with a net delivered quotation on the lighting material involved.

For purposes of illustration we

For some types of work, lighting must be brought close to the operation

will assume that a request for a layout for a steel mill chipping dock and prices to give a guaranteed in service illumination of 50 footcandles has been sent out. You would also ask the bidder to furnish the following information:

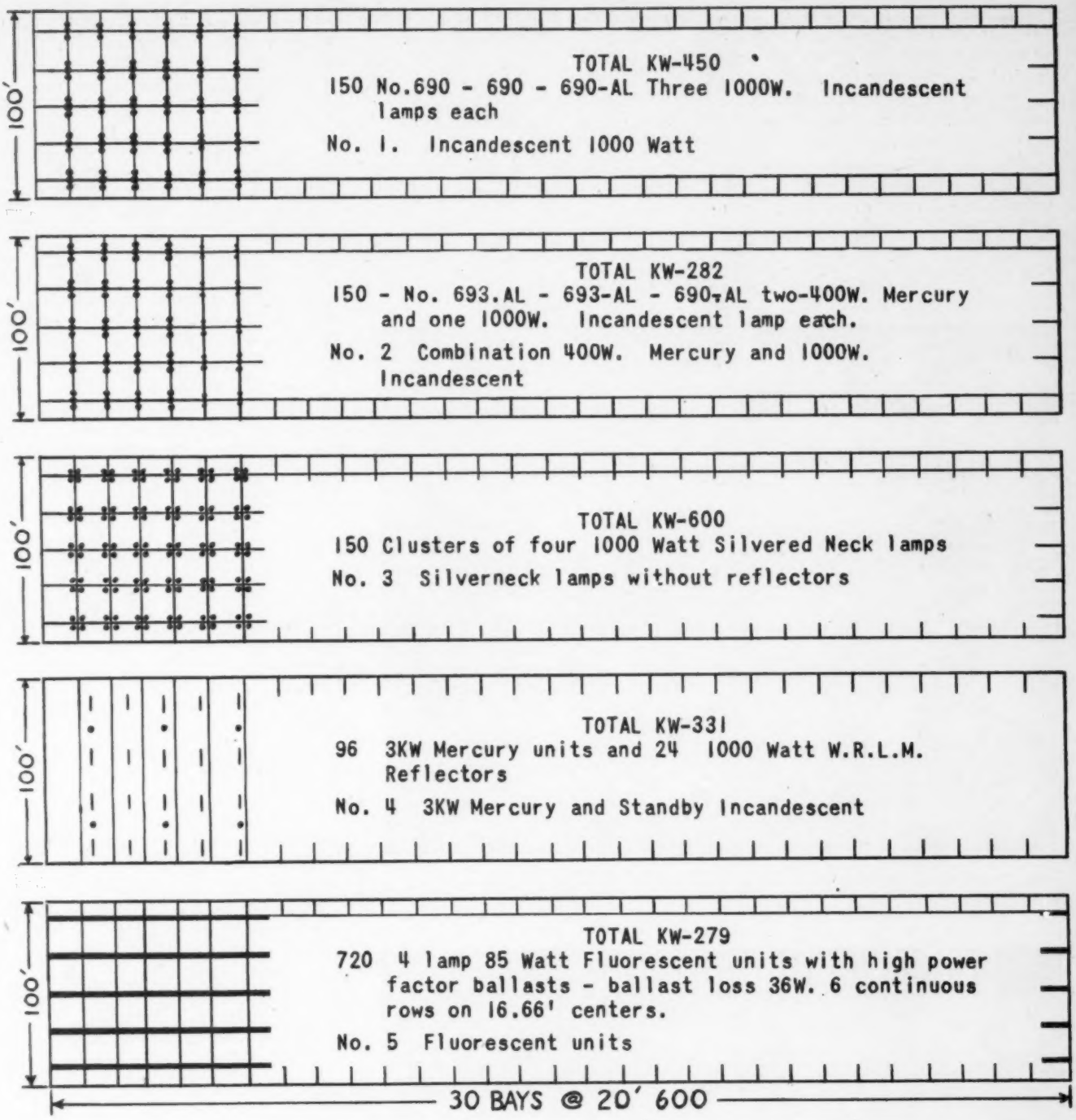
1. Are in service footcandles guaranteed?
2. What in service factor was used? Show breakdown.
3. Total kw including kw loss in ballasts and mercury transformers.
4. Size and type of lamps recommended.
5. Average life of lamps recommended.
6. Cost of luminaires delivered.
7. Cost of mercury transformers delivered.
8. Best possible delivery date.

These quotations and data would then be turned over to your electrical contractor or engineer for estimated cost of installation, including feeders, branch circuits, and switching.

All of this data would then be used in making a comparative cost analysis, as indicated in the attached tabulation. For the purpose of this example, five different types of lighting equipment and layout have been used to illustrate the variations that might be encountered both as to first cost and operating costs. It should be emphasized at the outset that these are not intended as any generalization on relative merits or costs of the various lighting systems considered, but only in respect to the particular application. For other types of operations, and in other industrial locations, the details of recommended installations would differ from those used in this example, and the relative evaluation would present quite different results.

The present problem concerns a steel mill chipping dock, 100 ft. wide and 600 ft. long, with thirty 20-ft. bays. The constant factors in the calculation are the requirement of 50 footcandles in-service lighting, for 7000 burning hours per year, and a current cost of $0.01 per kw. hr. To arrive at the cost per in-

Layout	No. 1 Incandescent	No. 2 Combination Incandescent-Mercury	No. 3 Incandescent Silverneck without reflectors	No. 4 3-kw. Mercury and Standby Incandescent	No. 5 4-85 Watt Fluorescent
Cost of installation and wiring	$83.50 per unit	$100. per unit			
	$12,500. total	$15,000. total	$12,500	$18,000	$43,000
Lighting load	450 kw.	150 kw. Incandescent 120 kw. Mercury 12 kw. Transformer loss 282 kw. Total	600 kw.	331 kw.	270 kw.
FIRST COST					
Cost of Fixtures, per unit	450 @ $26.40	450 @ $26.40	150 @ $24.00	96 @ $105.00	720 @ $25.00
total	$11,880	$11,880	$ 3,600	$10,080	$18,000
Cost of Spreaders, per unit	150 @ $24.00	150 @ $24.00			
total	3,600	3,600			
Cost of Transformers, per unit		150 @ $20.40			
total		3,060			
Cost of Reflectors, per unit				24 @ $5.00	
total				120	
Installation Cost	12,500	15,000	12,500	20,000	43,000
Sub-total, Fixed Charges	27,980	33,540	16,100	30,200	61,000
Cost of Lamps, per unit	450 @ $2.17	150 @ $2.17 300 @ $7.35	600 @ $6.15	96 @ $48.00 24 @ $2.17	2880 @ $1.60
total	976	2,530	3,690	4,660	4,608
TOTAL FIRST COST	$28,956	$36,070	$19,790	$34,860	$65,608
First Cost per in-service footcandle per sq. ft.	0.96¢	1.2¢	0.66¢	1.16¢	2.18¢
YEARLY OPERATING COST					
Current Cost	$31,500	$19,740	$42,000	$23,184	$18,900
Lamp Replacement, Incandescent	6,836	2,278.50	25,830	365	(Fl. 70/45) 7,168
(7) Mercury (7/4)		3,858.75		8,064	
Labor, Relamping & Cleaning,	5,250	2,625	3,150	252	(Group repl.) 1,680
Incand. Mercury		984.34		672	
Interest & Taxes (10%)	2,798	3,354	1,610	3,020	6,100
Obsolescence (10%)	2,798	3,354	1,610	3,020	6,100
TOTAL YEARLY OPERATING COST	$49,182	$36,194	$74,200	$38,577	$39,948
Operating Cost per in-service footcandle per sq. ft.	1.64¢	1.2¢	2.47¢	1.28¢	1.3¢


100'
TOTAL KW-450
150 No.690 - 690 - 690-AL Three 1000W. Incandescent lamps each
No. 1. Incandescent 1000 Watt
100'
TOTAL KW-282
150 - No. 693.AL - 693-AL - 690-AL two-400W. Mercury and one 1000W. Incandescent lamp each.
No. 2 Combination 400W. Mercury and 1000W. Incandescent
100'
TOTAL KW-600
150 Clusters of four 1000 Watt Silvered Neck lamps
No. 3 Silverneck lamps without reflectors
100'
TOTAL KW-331
96 3KW Mercury units and 24 1000 Watt W.R.L.M. Reflectors
No. 4 3KW Mercury and Standby Incandescent
100'
TOTAL KW-279
720 4 lamp 85 Watt Fluorescent units with high power factor ballasts - ballast loss 36W. 6 continuous rows on 16.66' centers.
No. 5 Fluorescent units
30 BAYS @ 20' 600

Layouts for 5 different types of lighting systems

SUMMARY		
Lighting System	First Cost	Operating Cost
No. 1 Incandescent	$28,956	$49,182
No. 2 Combination Incandescent-Mercury	36,070	36,194
No. 3 Incandescent Silverneck Lamps	19,790	74,200
No. 4 3 kw. Mercury	34,860	38,577
No. 5 Fluorescent	65,608	39,948

service footcandle per sq. ft., the total first cost and total yearly operating cost are therefore multiplied by 50 (footcandles) and divided by 60,000 (sq. ft. area).

For quick comparison, the results of the detailed tabulation are summarized in the smaller table herewith.

Analyzing this tabulation, it will be noted that No. 3 has the lowest first cost, but has the highest operating cost. No. 1 has the next lowest first cost but also the next highest

operating cost. The writer feels that an additional first cost can be justified if there is a saving in operating cost sufficient to pay for the additional first cost in three years, after which the annual saving in operating cost would be net.

The No. 2 combination incandescent-mercury system appears from the tabulation to be interesting from both a first cost and operating cost viewpoint. Comparing it with No. 1, it will be noted that the extra first cost of No. 2 is $7,000, but the operating cost is $13,000 per year less, so that No. 2 would pay for its extra first cost out of savings in operating cost within the first year.

Comparing No. 2 with No. 3, it will be noted that the first cost of No. 2 is $16,000 more, but the operating cost is $38,000 per year less. Consequently, No. 3 is not to be considered.

Comparing No. 2 with No. 4, it will be noted that No. 2 has a higher first cost of a little more than $1,000, but shows a saving of $2,000 per year in operating cost. No. 4 might be given more consideration as running a close second to No. 2 if it were not for the fact that No. 4 has some inherent disadvantages, e.g., the incandescent lighting component is only two footcandles as compared with 83 of mercury, so that a momentary voltage dip that would put the mercury out of use for the usual 10-minute time would cause work to stop for this period. Also, having practically all mercury light with very little incandescent component would give a poor color of light. (The analysis and comparison must take into consideration some factors other than the mathematical ones of cost alone.) The stroboscopic effect of the 3 kw. mercury lamps would not be desirable for operating compressed air chisels in the chipping operation. This stroboscopic effect is practically eliminated in No. 2 by the use of two lamp transformers having one lamp on lagging and the other on leading power factor. Of course, No. 4 could be designed to have less mercury and more incandescent lamp, but by so doing the operating cost would be further increased, and the cost comparison would go further out of balance.

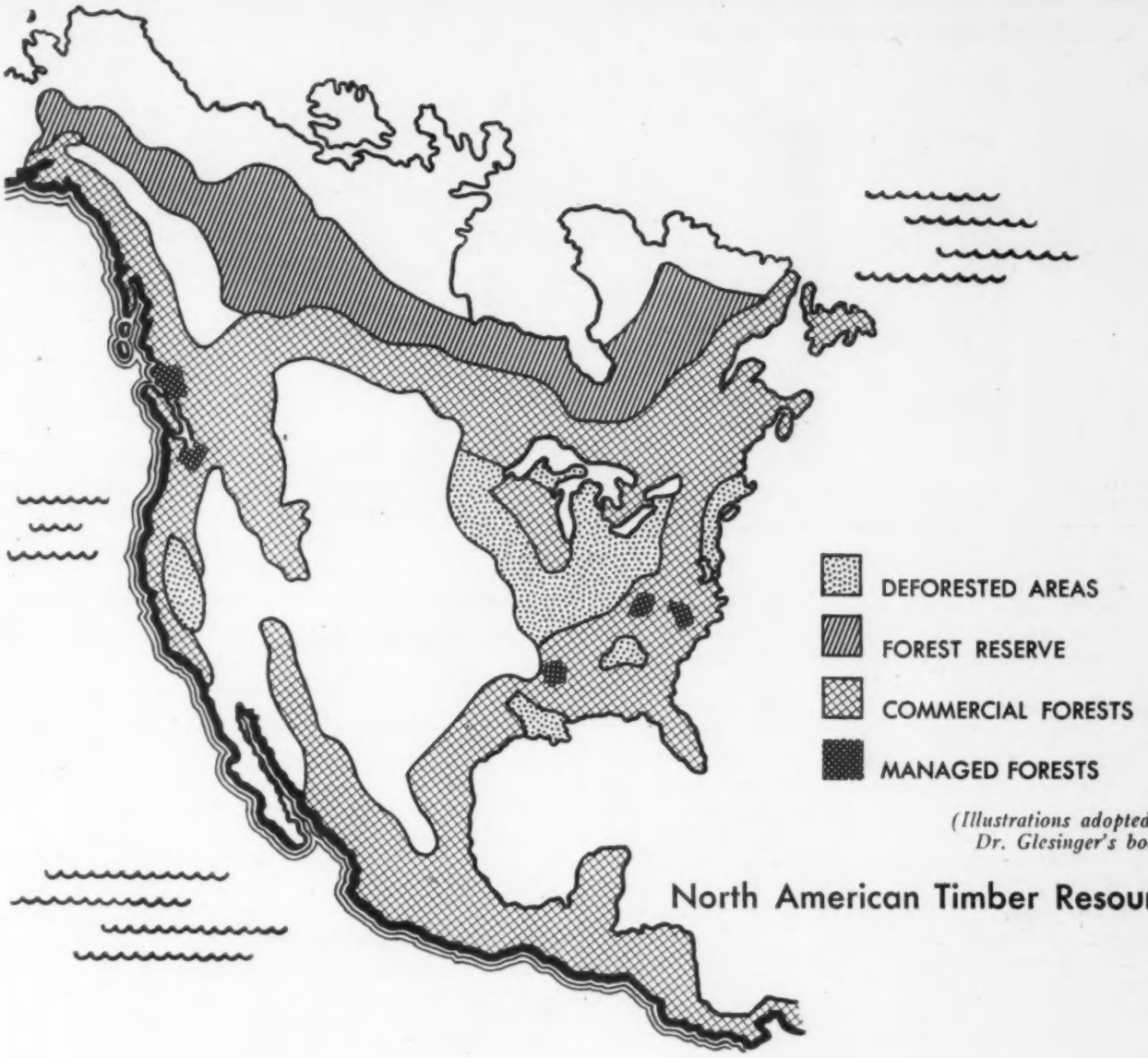
In considering No. 5, both the first and operating costs are high by comparison with No. 2, which puts No. 5 out of the running.

After such an analysis, the purchasing department can safely recommend the purchase of the No. 2 system for this particular installation, and has the figures to support such a recommendation. Incidentally, they will find that they are in arrived at the same conclusion for similar locations.

It must again be emphasized, however, that the economic analysis and study of the various lighting possibilities must be separately made for each installation—or at least for each type of installation—as quite different results will be encountered for the various types of lighting applications. Whereas No. 5, fluorescent, shows up unfavorably for the chipping dock, it may easily be the best solution for an automatic screw machine shop or for a drafting room, where the conditions and the requirements are different. Nor has the factor of appearance been considered in this analysis. There are some applications, such as in offices and public rooms, where the appearance factor may be a major good company, as many others have consideration.

Cost of servicing, cleaning, and lamp replacement must be considered in calculating the cost of lighting.

Incandescent lamps provide effective and economical lighting in this stock room installation.



(Illustrations adopted from Dr. Glesinger's book)

North American Timber Resources

Does Money Grow on Trees?

● **By Grey Leslie**

Amazing versatility of forest products as source of raw materials

Forests should be treated not as mines but as crops

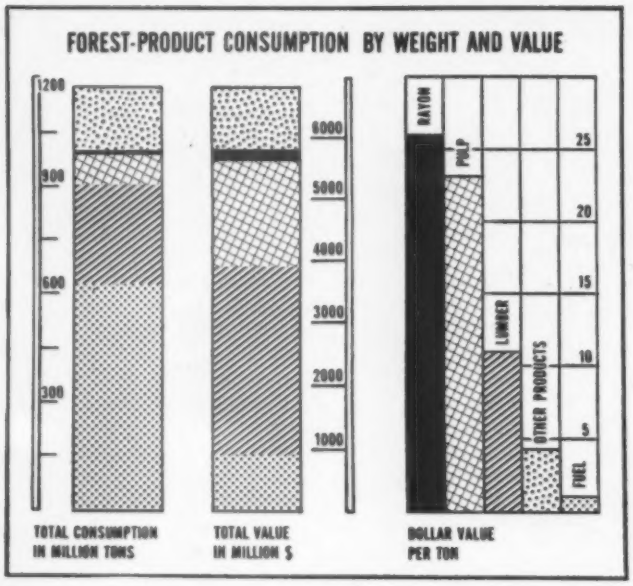
National program for replenishment and integration of timber industries

PURCHASING Agents are frequently asked "Does money grow on trees?" The question is put with varying degrees of petulance. Perhaps, as often, they ask it of others.

Money certainly does grow on trees, according to Dr. Egon Glesinger. His book "The Coming Age of Wood" (Simon & Schuster, N. Y., 279 pp., illus.) is an astonishingly persuasive and authoritative venture in optimistic prophesy.

Population experts and other types of experts have been warning us for some time that we are fast plundering our planet. They tell us that people are increasing more rapidly than their food and their basic material supplies, and that something will have to be done about it promptly if sheer starvation and economic disaster are to be averted.

In contrast to some of the more dismal prophets, Dr. Glesinger does not take too gloomy a view of our demographic future. The importance of his subject and its tremendous implications have not limited him to a purely scientific and statistical presentation of facts and conclusions. He has used many light touches in his book. They point up his message and yet give important emphasis to the necessity



More than half the world's annual supply of wood is used for fuel, yielding about $1 per ton and entailing 90% economic waste. Progressive Sweden converts timber to high-value products, adding more than $50 per capita to annual incomes.

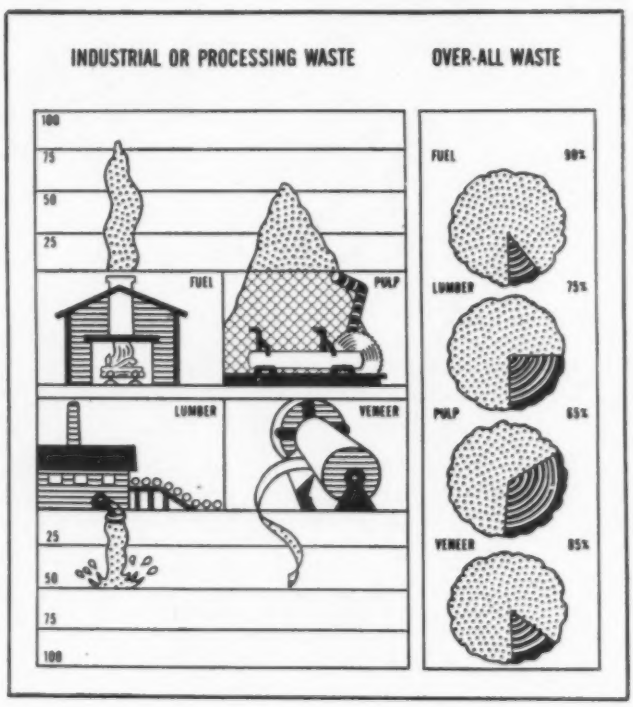
for laymen's fuller understanding of the serious problems involved in the continuous wasting of our forests.

The coming age of wood, Dr. Glesinger tells us, offers a sovereign remedy for many of our worries on several scores — but only if we have sense enough to cooperate with willing nature, instead of wasting and destroying her bounty. There lies the annoying but commanding "IF".

The author insists that much more than money grows on trees. He convincingly tells us that our national security, our economic strength, and a large measure of human comfort and happiness depend on our timber and its intelligent exploitation, its scientific cultivation, and its full use.

The enthusiasm with which Dr. Glesinger writes of the coming age of wood is infectious. His style in telling it holds the reader's close attention from beginning to end. It was a particularly happy idea to insert in the middle of the book some graphic illustrations that show how our trees build the raw material for an incredible variety of stuff out of air and sun, water and soil. In addition to the artistry with which the illustrator, Henry Billings, has produced these pictures, they convey lessons that should be in the fore-front of every school curriculum in the land. Their message has a particular significance and make a valuable contribution to adult education as well. The pictures are like impressive and dramatic explanatory interludes in a highly entertaining and most informative lecture.

More than 85% of the heat from firewood goes up the chimney. Finished lumber at the sawmill represents only 25% of the original tree. Pulp and veneer mills net only 35% and 15% respectively of their wood-cuts in end products. Forest industries waste is identical in substance with their end products; in the future they will derive the bulk of their combined output from the 80% of wood they now throw away.



The book is a mine of information and a challenge for everyone interested in the world's future supply of fuel, fiber and food. City-bound people, more or less complacent in their steel cages, have much to learn of their reliance on forests and trees and the by-products of wood in their daily living. The book is an excellent primer for such education and enlightenment.

It is filled with hope and economic optimism, refreshing in contrast to the spate of books and articles warning us of our destruction. If the proposals it contains were translated into action, the forests of the world, when properly managed, would bring an abundance that would insure "Freedom from Want" for all, within our own lifetimes.

We may know, but we frequently forget, the vast number of things made from trees. The book itself is printed on paper made of wood; the gum that binds the pages comes from the same sources. The covers, the jacket and the container had their beginnings in trees. There are myriad other products, both finished and raw, that have their origin in wood. Camera film, gunpowder, eye-glass frames, gas masks, shoe soles, rayon dresses, airplane fuselages, dolls, celluloid, cellophane, plastics, fertilizers and fountain pens; tannin, charcoal, rubber, maple syrup, alcohol, quinine, pitch, turpentine and rosin — all claim the same common parent. Their changed forms are oftentimes so clever that we never even associate them with their origin — a tree.

"During the war, wood found many new functions. It had long been a raw material for nitrocellulose — the 'gun-cotton' that impels a bullet. But for the first time turrets and ailerons of bombers were made of paper plastics, from wood. The propellers were often a wood alloy, and the fuselage was molded plywood. Rosin was used to stabilize the surface of landing strips.

"The flavor of your vanilla ice cream probably comes, not from

imported vanilla beans, but from synthetic vanillin made from wood. In Europe, wood added more than flavor to the diet. Besides supplying fodder for livestock, seasoned and broiled woodyeast made tasty hamburgers, which were seriously considered as a possible meat substitute. Wood also produces sugar for chocolate candies and grain alcohol for intoxicating beverages. As a medicine, wood appears in the guise of sulfa drugs, and, as an insecticide, in the guise of DDT. Wood even supplies sex hormones and Vitamin D.

"Soap can be made from wood; lignin yields a softening ingredient used in hand lotions. . . . . .Does the 'Coming Age of Wood' seem so fantastic, after all?"

Our nation is largely built of wood. Out of 28 million homes in America, 23 million are made of wood. Wood is the chief element in the manufacturing, processing, and delivery of practically everything we use.

Tragedy of Waste

Yet we have been allowing our precious timber to disappear twice as fast as it grows. In America we burn or waste more than 54 billion board feet a year — "enough to build a five room house every hundred feet on both sides of a road from Paris to Moscow."

"In his brief history on this earth, man has turned 4000 million acres of forest — one third of the world's original timber land, into a desert".

The cedars of Lebanon built Solomon's Temple as well as the great fleets of the famed Assyrians and Persians, but the forests from which these noble trees came have vanished and there remains to-day only a vast eroded and desolate waste.

Forests and rivers were the twin parents of civilization and were mutually dependent in an ideal union. The civilization we know, flourished beside the fertile banks of great rivers, but the sources of these rivers were in forest-clad mountains. When these sources were not protected by a heavy canopy of forest, the river valleys suffered catastrophic floods, destroying the settlements and silting up the river mouths.

With the wide-spread industrialization of the world, the forests of the earth have been continually shrinking.

Here in the United States we are beginning to feel acutely the effects of destructive cutting and processing practices that go back to our Colonial days. The Paul Bunyans of one timber frontier after another have swung their mighty axes through virgin forests from the Atlantic to the Pacific, wasting or ruining more than 70% of the timber they cut.

Over this nation more than 75 million acres of timber land are now so denuded as to be economically worthless. The desolate memorials of man's wanton waste sadly present themselves in deserted towns dotting these over-cut areas, and often even birds and animals have departed from them. In the relatively new logging country of the Far West, ghost towns are already appearing.

Are we repeating the folly of the ancients in destroying our forests and wasting our timber? Dr. Glesinger convinces us that we are. But he assures us that we can be warned in time to prevent utter disaster.

The rest of the world is far ahead of the United States in this matter of intelligent replenishing and efficient processing of timber.

Sweden survived the war more comfortably than any other country. She did so, according to Dr. Glesinger, not solely because she remained neutral, but because she properly exploited her timber resources. Sweden fitted 70,000 motor vehicles, 15,000 tractors and countless watercraft with wood-gas generators. She distilled 25 million gallons annually of 190-proof ethyl alcohol out of the sulfite liquors that our American pulp industries waste.

In a chapter entitled "Wood in World Politics" Dr. Glesinger gives a restrained journalistic report on the background of the cold logic that evolved Germany's European Wood Commission and the tremendous importance of wood in the calculations of the German Militarists in all their planning.

Indeed, according to Dr. Glesinger, the timber potential of the countries that fell one after another to the Nazis, was the principal incentive of their conquests and annexations. The example of Sweden's full use of timber during and after the war would seem to confirm his view.

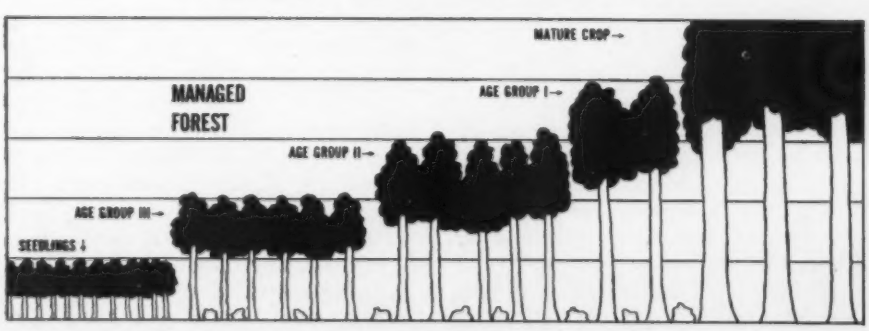
For America, as part of the wood age that is to come, the author foresees the possibility of fully integrated forest industries. We shall have to stop viewing the forests of the United States as a mine that will eventually be depleted or despoiled, and begin considering our timber and timberlands as crops and croplands. There are cases on record where timber has been cut continuously on managed land for more than fifty years and today has more than when the cutting started.

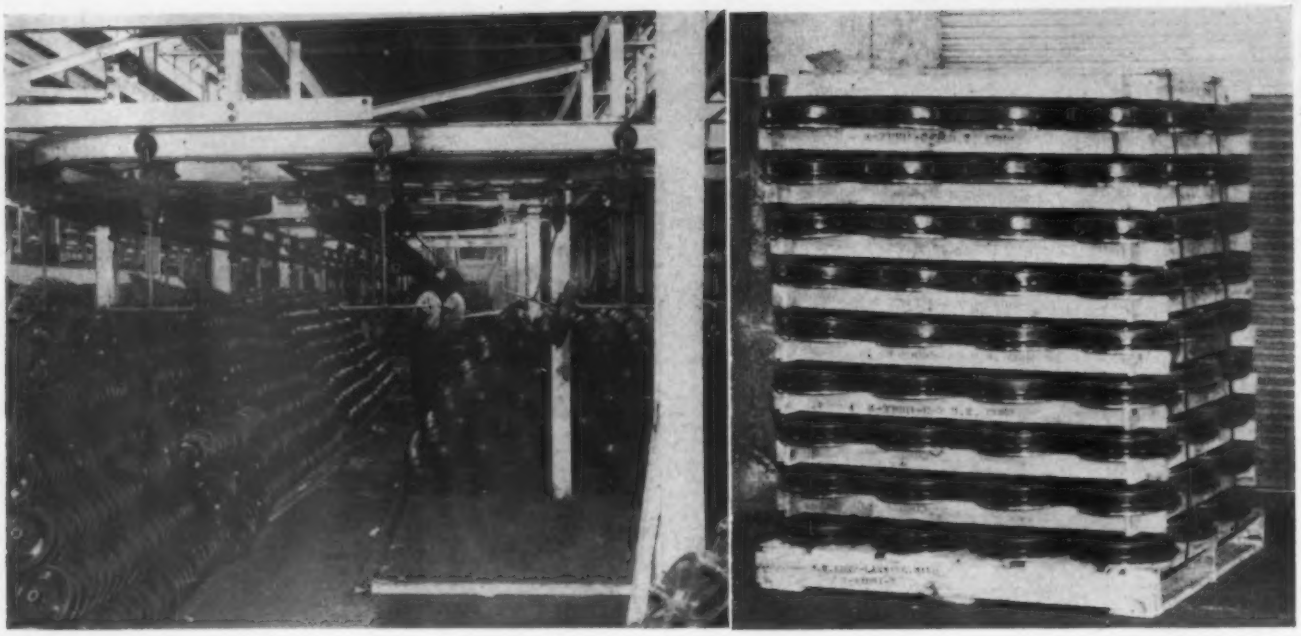
The happy contrast between short-sighted cutting and good forestry in the United States is illustrated by some of our largest forest operators. But the crux of the whole problem seems to lie in the small landholdings. Three-fourths of our commercial forest land is in private hands. Large operators are responsible for only a small part. More than 75% of the private forests are in the hands of owners who have tracts of less than 5,000 acres. There are over four million such owners with a total of 261 million acres. In their operations over 70% of their cutting is classified as wasteful or positively destructive. Add to that, the appalling fact that more than thirty-five million dollars worth of forests go up in flames every year.

If the program suggested by Dr. Glesinger were carried out, the for-

(*Please turn to page 296*)

In the virgin forest, decay balances growth to maintain equilibrium. The unmanaged forest is simply stripped. In the managed forest, there is systematic replanting; each generation of trees is thinned out by selective cutting as the trees mature, and every harvest yields the whole range of forest industry raw materials.





Hub and drum assemblies formerly were received loose and piled on the floor in storage areas. As needed, they were hung on a conveyor to be taken to production. Now they are received, 162 pieces in a pallet load; unloading time is less than 1/12 the former rate. They remain on the pallet up to the point of use, the complete load being moved by electric hand truck.

Paring Costs with Pallets

● *By Dwight G. Baird*

How Chrysler's materials handling studies revolutionized packaging practice

Advantages of palletizing benefit shipper, carrier, and purchaser of parts

Important economies effected in unloading time, storage space, and labor cost

MAJOR economies have been effected and much heavy labor has been lightened by Chrysler Corporation, Detroit, as a result of making studies and developing methods to get purchased parts shipped on pallets that can be unloaded and handled in bulk by industrial trucks.

Comparatively few such items were palletized prewar, due chiefly to lack of suitable powerized equipment for handling them. Development and improvement of specially-designed trucks provided such equipment, and Chrysler Corporation was quick to see the potential economies that could be effected by getting purchased parts and materials shipped in containers that could be unloaded and handled by such equipment.

The cost of handling materials is a large item in the manufacture of automobiles, hence here was an opportunity to reduce such expenses and thus to aid in holding the cost of cars within reasonable bounds in the face of mounting costs in other categories.

Before the Divisions of the Corporation could begin a program of palletizing parts, however, they first had to make a study of the whole problem to demonstrate the desirability of doing so. To this end the Divisions selected representative parts that appeared to best suited to this method of packing and shipping, then built pallets of different kinds, loaded these parts on them, transported them, unloaded them, photographed them, prepared the empty pallets for return shipment, and studied every detail of the operations. The Time Study Department was asked to make comparative studies and cost analyses of the old and new methods of unloading and handling these parts, and the findings constituted demonstrable proof of the company's contentions.

In making these studies, the Divisions worked directly with the staff master mechanic's office and the Purchasing Department on the projects. When each of them had completed a number of studies, they held a meeting at which each Division demonstrated various types of pallets which it had designed and

tested, and submitted comparative cost analyses. This meeting was attended by a representative of the Purchasing Department and the packaging engineer. Each Division submitted proposals, the packaging engineer investigated them and made recommendations, and the Purchasing Department conducted the necessary negotiations with the vendors concerned.

Quicker, Easier Handling

There was the case of front bumper face bars, for example. These parts were being received at the Chrysler Division's Jefferson plant loose in box cars, 821 pieces per load. They were unloaded manually and sent to storage on conveyor or dollies. When needed, getting them out of storage and transporting them to the production department took about as long as it had taken to unload them and transport them to storage. Arrangements were made to have a carload of these parts shipped in on pallets, and the time study revealed that the handling cost per 100 pieces was only about one-sixth as much as that of handling them loose. Not only so, but this cost could be reduced still further if they had the proper equipment for unloading and handling the palletized parts, such as a powerized hand truck.

Similar results were obtained when rear bumper face bars were palletized. These parts now are received on pallets, 60 pieces per pallet, and 14 pallets, or 840 pieces, per load. They are unloaded and handled by powerized industrial trucks in a fraction of the time formerly required to do so manually.

Closely related were front and rear bumper supports which were being received from the same source and which have now been palletized.

Then there were bumpers themselves. When these were palletized, an immense amount of heavy labor was replaced by mechanical handling, much less damage to the chrome-plated parts was sustained, and in some cases the conveyors formerly used to transport them to storage were dismantled.

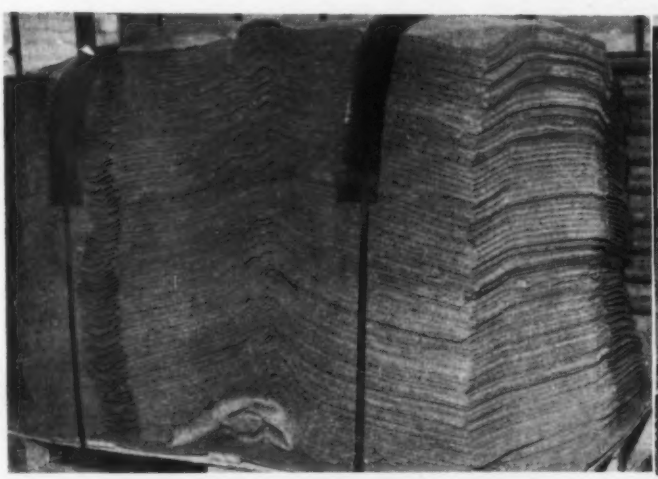
Also at Chrysler Division, radiator grilles formerly were received in crates, five pieces per crate, 80 crates per truck trailer load. These now are received on expendable pallets, 24 pieces per pallet, 20 pallets per load, and handling cost has been reduced about half.

Unitized Loads

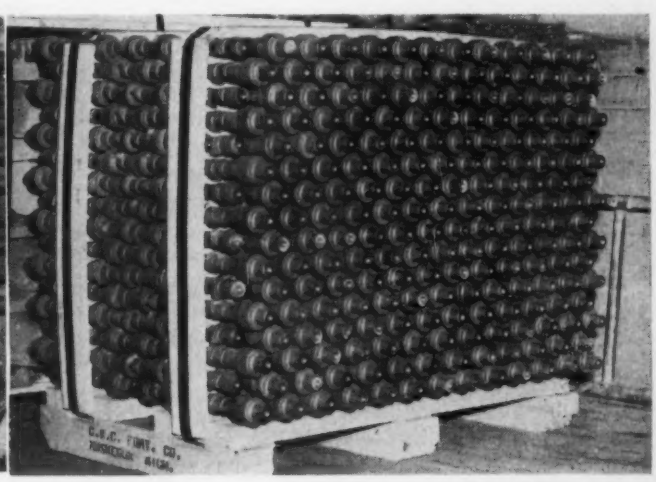
Many parts were and are received in cartons. But whereas such cartons formerly had to be handled individually, they are now strapped on pallets, or unitized packs have been designed for them.

Pistons are a good example. These formerly were shipped to the Jefferson plant in cartons of 50, and 300 cartons were brought in per trailer load. Now 1800 pistons, the equivalent of 30 cartons, are packed in an expendable tray-type pallet and the

Palletizing Solves Many Problems



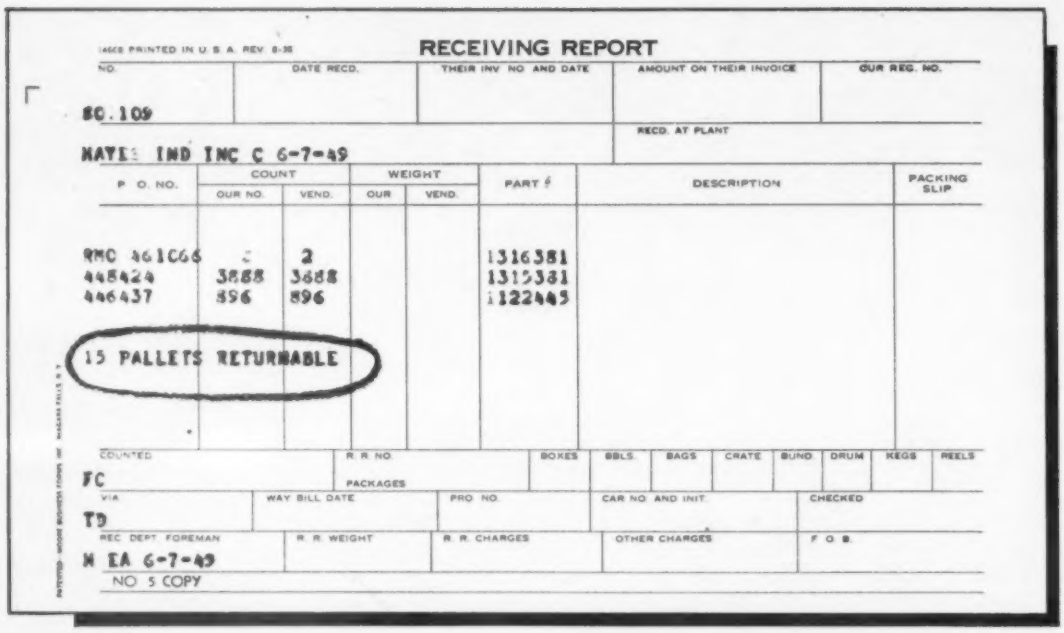
Floor mats—bundles were awkward and hard to handle.



Camshafts—heavy; this unit load weighs 4,270 pounds.

Cushion springs—bulky; storage piling is simplified.

Carburetors—special trays save cartoning, unpacking.



RECEIVING REPORT

NO.	DATE RECD.	THEIR INV. NO. AND DATE	AMOUNT ON THEIR INVOICE	OUR REG. NO.
80.109				

RECD. AT PLANT

HAYES IND INC C 6-7-43

P. O. NO.	COUNT OUR NO.	COUNT VEND.	WEIGHT OUR	WEIGHT VEND.	PART #	DESCRIPTION	PACKING SLIP
RMC 461066		2			1316381		
448424	3888	3688			1315381		
446437	896	896			1122445		

15 PALLETS RETURNABLE

COUNTED	R. R. NO. / PACKAGES	BOXES	BBLS.	BAGS	CRATE	BUND.	DRUM	KEGS	REELS
FC									

VIA	WAY BILL DATE	PRO NO.	CAR NO. AND INIT.	CHECKED
TD				

REC. DEPT. FOREMAN	R. R. WEIGHT	R. R. CHARGES	OTHER CHARGES	F. O. B.
H EA 6-7-43				

NO. 5 COPY

Accounting for returnable pallets starts with a notation on the receiving report.

handling cost has been reduced from many dollars to a few cents per load.

Valves formerly were packed 480 pieces per carton, and the cartons were quite heavy. Now they are received in a returnable pallet box, 7,392 pieces per pallet, and handling cost has been reduced by more than half. These loaded pallets weigh 1,902 lbs. each, but handling them with industrial trucks is an easy task.

Carburetors, too, were received in cartons, 18 6-cylinder carburetors or 6 8-cylinder ones per carton, 5,300 carburetors per trailer load. A special, unitized container that holds 336 carburetors was developed by this vendor which no doubt reduced his own handling cost. At any rate, the receiver's handling cost was reduced by more than two-thirds as a result.

Chrysler Corporation now receives about 25% of its purchased parts on pallets and the number is still increasing. It also provides pallets on which to unload and handle such items as kegs of nails, drums of sound deadener, heaters, radiator cores, and others, and for handling, inter-plant shipment, and storing many of its own parts and assemblies. In addition, it has developed many special racks for sheet metal parts of various kinds.

Ingenious technique takes advantage of the shape of aluminum pigs (used for making pistons) so that wire strapping creates a "palletless pallet". They were formerly shipped loose and handled one at a time. This double-deck-load takes two bundles — 102 ingots—at once.

Savings in Storage Space

In addition to effecting economies in unloading and handling, palletizing parts has other advantages. A major one is that of space saving. Consider hub and drum assemblies as an example. These assemblies formerly were received loose and were taken to the storage area on a conveyor, then taken off and piled on the floor. When needed, they were rehung on a conveyor which took them to production. Now they are received on pallets and handled by fork trucks which tier them two and three pallets high. This alone has effected an estimated saving of 4,300 sq. ft. of floor space in the corporation's plants. It has also eliminated a hazard and has eliminated much handling and rehandling.

As compared with skid boxes, which long have been used and still are used extensively for storage purposes in automobile plants, the bottom of a skid box usually is 12 inches or more above the floor, whereas that of a pallet is only four inches off the floor. If the containers are stacked even three high, then, the saving of vertical space by using pallets amounts to two feet per tier.

Advantages for Carriers

Then there is the problem of unloading facilities such as receiving docks. With increasing production postwar, congestion had become a

serious problem and the point had been reached where expanded or additional receiving facilities had to be provided, or else arrangements had to be made to unload faster. Palletizing made it possible to unload shipments in a fraction of the time previously required and so solved this serious problem.

Railroad companies and highway truckers have found palletizing to be about as much to their advantage as it is to others concerned. So true is this that some of the railroads have acquired their own pallets and powerized equipment for handling unpalletized freight at their large terminals. The biggest advantage to the carriers, though, has been in the reduction or elimination of delays to their equipment and in getting a return shipment of empty pallets.

Probably the most promising prospect in connection with the return of empty pallets is the development of expendable ones that don't have to be returned. These have been on the market for some time, but to call them expendable heretofore was an exaggeration. Prices have declined somewhat, though, and such pallets have been improved to the point where they are being used in a surprising number of ways. It is expected, therefore, that larger volume will enable manufacturers to improve their production methods and reduce prices still further.

Special study is being devoted to development of expendable pallets for all parts that have to be shipped more than 100 miles, because the cost of returning empty pallets so far tends to offset the economies otherwise effected. About 20 per cent of pallets now received by Chrysler Corporation are of the expendable variety and the percentage is increasing.

Suppliers furnish their own pallets but are reimbursed in one way or another by their customers. This is a matter of negotiation between the Purchasing Department and the individual suppliers. There is no uniform practice, because too much depends upon circumstances. The number and names of parts to be palletized, methods of palletizing, amount per pallet, definition of terms, and other details are agreed upon in writing in each case.

Collapsible returnable pallets for handling door panels. Besides ease of handling, vertical storage is made possible.

The number of pallets received with each shipment is entered on the receiving slip. Where pallets are to be returned, the charge for them is entered on the purchase order. This amount is refunded to the purchaser on return of the pallets in good condition. Containers wear out, get damaged, or even get lost, though, and this shrinkage is an item that must be considered. When claims arise in this connection, the buyer refers them to the packaging engineer and the latter negotiates with the vendor and makes a satisfactory settlement.

Parts are kept on original pallets until used. Empty pallets then are picked up by the regular truckers and taken to designated points just outside the building where they are picked up by yard trucks and taken to pallet storage areas nearby. There returnable pallets are collapsed, strapped together, or otherwise prepared for return shipment and are picked up by vendors' highway trucks or else are loaded in railroad cars for shipment.

Powerized Truck Equipment

Essential equipment for unloading and transporting palletized parts is the powerized fork truck. Many types and makes of these are on the market. One of the most popular and probably the most economical types used in the automobile industry for this purpose is the electric hand truck. These are small and comparatively inexpensive and they do a surprising amount of work. Each of such trucks has two batteries and one of them is kept on charge while the other is in use.

Larger trucks of the riding type are required for many purposes, however, and the number of these in use usually is about the same as that of the little electric ones.

Not a Cure-All

Some small parts cannot be palletized economically, while some larger ones can be handled more conveniently in bundles. Palletizing, therefore, is not the answer to every materials handling problem. Nor are the economies effected all clear savings. Pallets cost something, some expense is involved in returning them, suitable equipment must be provided for handling them, there is some shrinkage, and even the clerical work involved is to be considered. Such costs involve many variables. Pallets are of many different types, prices of them vary widely, and the cost of returning them depends largely upon the type of pallets, kind of carrier, and distance shipped.

Nevertheless, palletizing has effected notable economies and has definitely proved to be the answer to many materials handling problems. Now that this method of packing and shipping is becoming more common and is proving its worth to the shipper as well as to the receiver, more and more products are being palletized and the number of parts so received is increasing each week.

Purchasing Organic Coatings

Study the limitations of organic finishes as well as their advantages

Application methods are just as important as the coating compound itself

Special care is needed to assure dealing with sound and ethical suppliers

•

By Thomas A. Dickinson

ALTHOUGH they have been frequently misunderstood and misused, organic coatings are among the most practical materials for a majority of industrial finishing operations because they are comparatively inexpensive and compoundable for many different applications.

They are manufactured as two general types of resinous fluids. One of these comprises polymerized resins dispersed or suspended in solvents (along with pigments and other compounding ingredients) so that they will be solidified after they are applied as the result of evaporation. The second group comprises unpolymerized or "unsaturated" resinous fluids which are compounded without the use of solvents so that they will be polymerized or hardened after they are applied as the result of an internal chemical reaction. The latter fluids are sometimes referred to as "plastic" or "synthetic" coating materials and may be solvent-thinned for different applications, even though they will not solidify as the result of solvent evaporation.

In any event, the film or finish produced by means of an organic coating material is essentially a resin whose transparent or opaque properties are dependent on the plasticizers and pigments which are used to modify or improve the resin's inherent qualities. This is an important point to bear in mind; for, while it must be acknowledged that "plastic" coatings have certain desirable features, the efficient purchasing of organic finishing materials can be achieved only when all aspects of a specific coating problem have been studied.

For example, it is necessary to consider the nature of the surfaces that must be finished and the amount of supplementary processing that will be required. Can the surfaces be prepared for coating with ordinary soaps or chemical solutions? Or will special cleaning equipment, such as solvent degreasers, have to be purchased? How many applications will be needed to produce a satisfactory finish on this or that surface with a given coating compound? And what sort of spray booths, curing ovens, conveyors, etc., must be utilized for best results?

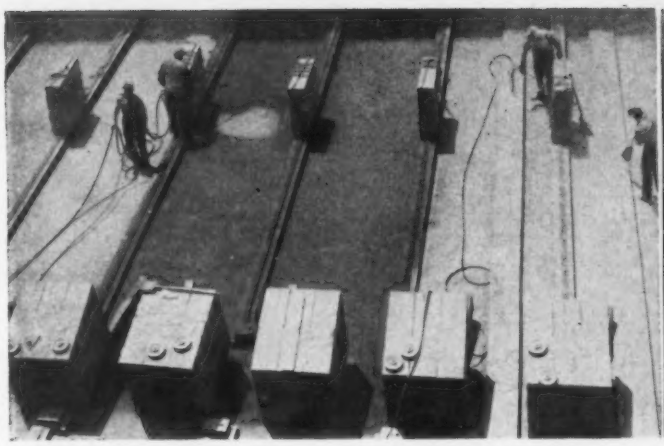
James Stocker, Purchasing Agent for Harwood Specialties of California, paused to find the answers to these questions when he was asked to buy a batch of "polymerizable" coating materials for the wood products manufactured by his company. He was inclined to favor the new materials at first, when he learned that they would produce a high-gloss finish with only one application, whereas ten applications of conventional wood lacquers were required for equivalent results. Then he discovered that the polymerizable coatings would have to be baked on, rather than air-dried like the previously used lacquers, and decided to find out how hardwood materials would react to the required quota of heat. A single test was made, and Stocker saved his company hundreds of dollars in new coating materials, equipment, and work spoilage, by proving that the heat could warp the most expensive hardwood cabinet into a worthless piece of junk.

Surface cleaning and preparation often determines whether the finish will prove satisfactory.

Similarly, tests were recently made to determine whether polymerizable coatings could be used for the rapid refinishing of automobiles at Pelton Motors, Inc., of Los Angeles. Result: Pelton workers are now, both literally and figuratively, able to refinish cars on a while-you-wait basis—and, because no sacrifice has been made with regard to quality, Pelton now enjoys an unprecedented volume of business.

The resins used in organic coating materials are classed as "natural" or "synthetic", depending on the amount of processing required to derive them from natural substances. For instance, rubber and shellac are natural resins (being directly extracted from trees and Asiatic lac insects) while phenol-formaldehyde is considered a synthetic resin (being processed to such an extent that it is completely unlike the coal tar and other materials from which its elements are derived).

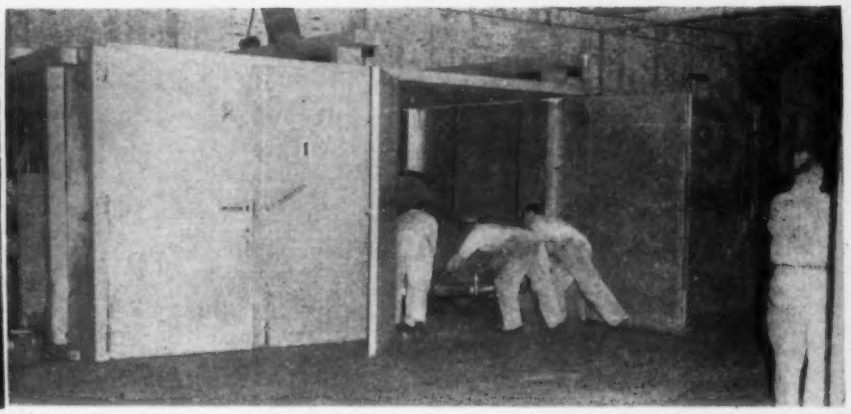
Coatings based on synthetic resins or combinations of synthetic and natural resins have numerous advantages when they are properly used, but it is well worth noting that chemists have not yet developed synthetic resins which will exceed the most desirable properties of natural resins in every respect. For



A rubber-base material is used to finish and "skid-proof" the deck of a U. S. Navy vessel.

Organic adhesive coatings are extensively used in silk-screen stencils for duplicating work.

Applying a clear lacquer finish on hardwood by the spray-gun method.



Automobile refinishing can be done literally while you wait, with new coatings and proper equipment.

example, U. S. Navy purchasing officials still specify a rubber-base coating known as Saf-T-Coat for the decks of seagoing vessels because it is both durable and skid-proof—the latter being an essential safety feature that has not been satisfactorily duplicated with synthetic-rubber or elastomeric-plastic resins for coating compounds.

At Acme Display Company of San Diego, it was until recently a practice to use thermosetting plastic adhesives as coatings for stencil paper in the fabrication of silk-screen stencils for the duplication of showcards and signs. Then Purchasing Agent William Sechrist began wondering why the cost of stencil silk couldn't be lowered by cleaning and reusing discarded screens, and learned that paper and silk could not be separated after adhesion without damaging the silk, because thermosetting adhesives are substantially insoluble and infusible after they have been cured. Accordingly, Sechrist began looking for a soluble and fusible thermoplastic that could serve as a paper-silk adhesive coating and yet be dispersed with solvents or heat-softened for reclamation purposes.

"My investigation required a lot of time," Sechrist recalls, "because I started out by checking on all the newer types of synthetic thermoplastics—which were developed, in most cases, for superior heat and chemical resistance. But, after I finally got around to the older types of coatings, I realized in no time at all that shellac would do the trick—and at less than 50% of the cost of our thermosetting adhesives."

Production-minded engineers and executives are often inclined to evaluate organic coatings in terms of the time required for drying or curing after they are applied. This is a good idea where fast-drying finishes are practical, with reference to both quality and quantity; but, unfortunately, the best coatings for many surfaces require hours—and sometimes days—of solidification time.

In some cases, driers can be added to organic materials to speed finishing operations; but, as a rule, it is advisable to avoid extra-curricular compounding which is not specified by coating manufacturers or consulting chemists.

A typical example of the haste-waste relationship was disclosed several months ago in one of the west's oldest and largest metal-products factories, after several thousand dollars' worth of kitchenware had been rejected due to cracked enamel coatings. At first, the rejections appeared to be the result of freak accidents, because the company had been using the same enamel finishing materials for several years without similar difficulties; but after the rejections continued without diminution for a period of several weeks, the company's purchasing agent was asked to write a letter of complaint to the coating manufacturer. In order to write the letter effectively, the P. A. checked his file of purchase orders for finished materials and incidentally noticed that, since the rejections began, the requisitions and orders for driers had been unusually large.

Because he didn't consider himself an expert with reference to coating materials, the P. A. decided

(*Please turn to page 292*)

Liability for Misrepresentation

Seller must not convey false impressions of quality by statement or implication

Be prepared to show actual damages in suits for unfair competition

Purchaser shares liability if valid rights of a competitor are infringed

● **By Leo T. Parker**

RECENTLY a reader wrote, as follows: "Being a purchasing agent for a large corporation I read with interest your legal writings which appear monthly in PURCHASING. On more than one occasion I have referred back to your articles, which I file away, and effected considerable savings to our firm.

"One subject you seem to have not covered relates to false advertising by sellers and the right of a purchaser to cancel a purchase contract and recover damages from a seller who thus misrepresented his merchandise.

"We have a law suit on our hands at this time. Perhaps you can assist us to win it. For our corporation I purchased a large quantity of canned corn which the canning company had advertised through mail as being high quality. Our corporation resold the corn to a purchaser. Later the government agents condemned the corn as not being standard quality although it was not unfit for human consumption. Please cite a higher court case to assist our lawyer to win this case. We contend that the purchaser cannot receive damages because no guarantee was given that the quality of canned corn would be approved by Federal agents and since the corn is not unfit for human consumption this purchaser has no recourse. What is your opinion as to our responsibility?

Quality Is Misrepresented

Modern higher courts consistently hold that when either a manufacturer or other seller misrepresents his product, either by false advertising or fraudulent contract clauses, the purchaser may rescind the purchase contract and recover adequate damages.

For example, in Myers v. Malone & Hyde, Inc., 173 Fed. (2d) 291, the testimony showed facts, as follows: A canning company sold 2,272 cases of canned tomatoes to Myers Milling Company which Myers sold to a wholesale grocery company. The Myers Company sold the tomatoes as Extra Standard in quality.

The government condemned the tomatoes on the ground that the cans were shown on test to contain less than the percentage of drained weight required by the Pure Food, Drug, and Cosmetic Act. The grocery company got authority from the court to label the can "Below Standard in Quality—Good Food—Not High Grade". As they were not merchantable in ordinary course of business the grocery company disposed of them for the best price obtainable, and then sued the Myers Company for the difference between the price paid for the tomatoes and the price received on the open market. The higher court held the Myers Company liable to the grocery company for $7,333.00 and said:

"The evidence here is clear that the canned tomatoes on being subjected to prescribed tests were below standard grade and were misbranded. . . . The proof established that Myers (company) had sold the canned tomatoes to plaintiff (grocery company) as Extra Standard in quality and they were not of that quality but were of inferior quality. . . . The undisputed evidence in the record clearly established that Myers became indebted to plaintiff (grocery company) on account of Myer's breaches of warranty in its sale of the tomatoes in the amount for which judgment was rendered against it."

Certification Not Conclusive

According to a recent higher court a canning company is liable on an *implied* guarantee that canned food is reasonably worth the purchase price, and further that the merchandise does *not* violate the Federal Food, Drug, and Cosmetic Act. This is so although properly authorized government agents tested and approved the product.

For example, in Smith v. Great Atlantic & Pacific Tea Company, 170 Fed. (2d) 474, the testimony showed facts, as follows: The Smith Canning Company sent the Great Atlantic and Pacific Tea Company, a buyer, a telegram: "Do you want 3300 cases standard twos spinach 1.10 Government Certificate", to which the buyer responded, "Will accept certificated spinach offered if last of February shipment okay advise if available our labels." A formal contract followed, by the terms of which the buyer bought 3600 cases 24-2 Iona Label Full Standard Spinach at 1.10 dozen to be shipped in box cars each containing 1800 cases of 24 cans with Government Grade Certificate attached to invoice. The goods were shipped with inspection certificates from the United States Department of Agriculture attached to the bills of lading certifying the grades to be U. S. Grade C or U. S. Standard. Before issuing the certificates the inspector of the Department of Agriculture inspected the spinach by opening some of the cans in each lot.

The buyer paid the price agreed on and resold some of the spinach but the remaining part was found on analysis to be unfit for human consumption because it contained "filth" consisting of plant lice of the genus known as aphis and was seized and condemned for that reason in libel proceedings under the Food and Drug Act.

The buyer sued the canning company for damages claiming a breach of contract to supply canned spinach which did not violate the Federal Food, Drug, and Cosmetic Act. The counsel for the canning company argued that because the spinach was inspected and certified U. S. Standard Grade by the federal inspector, the canning company could not be held liable. However, the higher court ordered the canning company to pay the buyer $6,495, and said:

"Tests are not conclusive, one way or the other. . . . Though the few cans of spinach examined by the inspector may not have contained aphis, the buyer would not be precluded from recovery on the warranty of merchantable quality of the spinach by the inspector's examination. . . . The spinach when opened and analyzed was found unfit and that is evidence that such was its condition when sold."

Validity of Disclaimer

Considerable discussion has arisen from time to time over the legal question: When and under what circumstances is a clause valid and effective in which a seller disclaims all responsibility for false or incorrect advertising, statements and guarantees?

The answer is: A seller is relieved from false advertising when the testimony shows that he placed within easy access of the purchaser a notification that he would not be liable for any warranty.

For example, in Kennedy v. Corn Company, 19 N. W. (2d) 51, a purchaser sued a seller to recover heavy damages, and testified that he was induced to purchase defective merchandise by the seller's false newspaper and radio advertisements.

During the trial the seller proved that at the time of the sale and delivery of the merchandise there was delivered and accepted by the purchaser an advertising circular describing the merchandise, together with the price. Plainly printed on the face of the circular were the following conditions: "Notice: We give no warranty, express or implied, . . . and we assume no responsibility. . . ."

The lower court held the purchaser entitled to recover heavy damages from the seller, but the higher court reversed this decision. In holding the seller not liable the higher court held that a disclaimer of warranty clause printed on a bag or container or other location, is valid and effective if by the application of ordinary care the purchaser should have observed and read it.

In other words, it is sufficient to relieve the seller from a guarantee if the testimony shows that the disclaimer clause was printed upon the package containing the merchandise, or upon the invoice, or in the catalog, so that it *might have* come to attention of the purchaser had he exercised an ordinary degree of care to discover it.

Misbranded Merchandise

If a purchaser offers for sale merchandise bearing an infringing trade-mark or having labels held by a court to violate unfair competition laws, the purchaser is equally liable as the seller or manufacturer.

Also, all higher courts agree that sellers impliedly warrant that merchandise they sell is merchandisable. Therefore, purchasers of misbranded merchandise may rescind the contract, and recover from the seller the full contract price, plus all incidental damages. This is so whether or not the misbranded merchandise is seized, condemned or confiscated by government agents. However, in order that readers may have at first hand dependable information as to what comprises "unlawful misbranding", we shall review a few late higher court decisions involving merchandise condemned by government agents and validity of "condemnation".

Another important point of law is that the higher courts approve demands of the Federal Trade Commission to stop misleading and false representations of sellers of merchandise.

For example, in Edward Company, Inc. v. Federal Trade Commission, 169 Fed. (2d) 294, the testimony showed that a manufacturer and importer publishes and distributes its catalog to 25,000 retailers. Among other items in this catalog was a "line" of table lamps, cigarette boxes, ash trays and candy boxes. The following expressions were used in the catalog: "Imported 'Du Barry' Porcelain", "Imported Hand Decorated 'Du Barry' Porcelain", and "'Du Barry' Porcelain Table Lamps are nationally famous as reproductions of rare original French and English 'old pieces'."

The Federal Trade Commission ordered the importer to stop use of these descriptive statements on the ground that purchasers were misled to believe that the products were of British or French origin, and that the representations were false, deceptive and misleading since the porcelain part of the products was made in Japan.

The importer appealed to the higher court, which approved the Commission's decision and order. The court said:

"The order . . . merely directs that the company not represent to the public that products made in Japan are imported from elsewhere. There was substantial testimony that the advertising conveyed to both retailers and consumers the impression that the porcelain was of French origin."

With respect to the importer's argument that the advertisements could not be misleading, because of the very low price at which the

product is sold, the higher court said:

"The premise is an admission that the words of the advertisement are misleading, and the ensuing contention is that the natural implication of the words is offset by the price. In substance, the argument is that a seller has a right to envelop a cheap article in an admittedly misleading aura of value so long as the price remains low. . . . If it has no desire to conceal the fact that the porcelain portion of these products is made in Japan, it could have no possible objection to so stating in its advertisements."

Advertising Held Illegal

A late higher court recently held that the Federal Trade Commission may stop any kind of advertising in newspapers and magazines, folders, circulars, and radio broadcasts, when such advertising is "in the honest opinion" of the Commission unfair or deceptive.

For example, in Radio Company v. Federal Trade Commission, 143 Fed. (2d) 29, the Federal Trade Commission issued an order directing a manufacturer to cease and desist from certain advertising practices. The Commission proved that the manufacturer advertised that users of its short wave sets could hear Europe, South America or the Orient every day. The higher court upheld the Commission's order, saying:

"The commission found from evidence not in dispute that due to certain atmospheric conditions and electrical disturbances which the radio industry had been unable to overcome, the satisfactory reception of foreign broadcasts every day is impossible. . . ."

Also, this court held that it is unlawful and misleading for a radio manufacturer to advertise or state that its radios have a designated number of tubes which number includes rectifier tubes which do not perform the primary function of detecting, amplifying, or receiving radio signals. In other words, when specifying the "number" of tubes in a described radio the manufacturer must not include rectifier tubes.

False Advertisements

According to a recent higher court, chemicals and drugs falsely advertised as to curative qualities may be confiscated by the government.

In Research Laboratories, Inc. v. United States, 167 Fed. (2d) 410, it was shown that a company is engaged in the manufacture, sale, and distribution of proprietary drug and chemical products known by certain trade names continuously since 1925. One of these is sold direct through druggists to consumers. In concentrated form, and under a different trade name, it is sold to licensed physicians. The company's direct sales program involves extensive use of advertisements in daily and weekly newspapers and similar publications. The government agents seized 600 cases of the product, and proved that there appeared in newspapers a false advertisement, as follows:

"I suffered for years and am so thankful that I am free from pain and able to do my work that I will gladly answer any one writing me for information, Mrs. Anna Pautz, P. O. Box 825, Vancouver, Washington."

The higher court approved confiscation of the drug although the false statements were not part of the labeling. The court said:

"The jury has determined that it hasn't any value for that purpose, so it would be inconsistent, it seems to me, for me to hold that it should be preserved and released to the claimant."

Separated Shipments

It has been held that a product is falsely labeled if misleading circulars or advertising matter pertaining to the product are shipped with the product, or in different shipments which arrive at destination about the same time.

In Kordel v. United States, 69 S. Ct. 106, one Kordel was charged by the United States government of delivering for introduction into interstate commerce "misbranded merchandise". Kordel argued that he was not liable because at no time did he mail or ship the circulars or advertising matter *with the merchandise*. The Supreme Court held Kordel liable saying:

"The false and misleading literature in the present case was designed for use in the distribution and sale of the drug product, and it was so used. The fact that it went in a different mail was wholly irrelevant. . ."

Injunction Too Broad

According to a recent higher court, an injunction is void which prohibits a manufacturer from shipping any of its products, although the testimony shows that *all* its products *now* are misbranded "or adulterated".

For illustration, in Hygrade Corporation v. United States, 160 Fed. (2d) 816, it was shown that butter, cheese and cheese products are processed by a corporation.

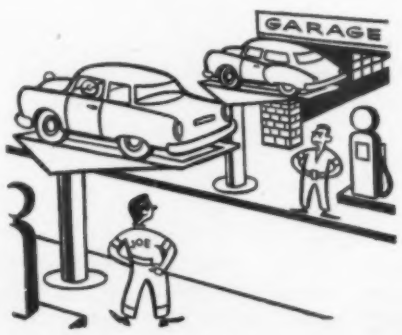
The higher court refused to approve an injunction issued by the lower court restraining the corporation from shipping any of its products in interstate commerce for two years. The higher court held that such an injunction violates reasonable law since it denied the corporation the right to ship *any* products in interstate commerce irrespective the fact that it may make products of purity. This court said:

"It is merely conceivable that with its present equipment and personnel, defendant (corporation) could process products that are not adulterated, and if so, it should be permitted to have such products transported in interstate commerce."

Unfair Competition

It is true, of course, that one who practices unfair competition may be held liable to another who sustained damages. However, according to a recent higher court a person who is *not* in business cannot receive damages from a competitor for unfair competition.

For example, in Scutt v. Bassett, 194 Pac. (2d) 781, it was shown that the California Lift Company sued the Moard Welding Works for damages for unfair competition. The testimony showed that the



how to GET MORE WELDING from your PIPE WELDERS

The exceptional accuracy and uniformity of Midwest Welding Fittings enable the welder to spend more time in welding and less time in preparation. He does not have to struggle to line up fittings and pipe . . . all pipe can be cut in advance according to drawings . . . he need never compensate for inaccuracies. Time and money savings are substantial.

The dimensional accuracy and uniformity of Midwest Welding Elbows result from a unique method of manufacture. These elbows are first made slightly oversize . . . then reheated to forging temperature and brought to final size in *compression dies*. This assures true circular cross section, uniform wall thickness and accurate radius, included arc and tangents.

Midwest Welding Fittings save you money . . . there is a distributor near you . . . it will pay you to call him.

3718

MIDWEST

PIPING & SUPPLY COMPANY, Inc.

MAIN OFFICES: 1450 SOUTH SECOND ST., ST. LOUIS, MO.

PLANTS: ST. LOUIS, PASSAIC (N.J.) and LOS ANGELES

MIDWEST WELDING FITTINGS Improve Piping Designs and Reduce Costs

SALES OFFICES

New York (7), 30 Church St. • Chicago (3), 79 West Monroe St. • Los Angeles (33), 520 Anderson St. • Houston (2), 229 Shell Bldg. • Tulsa (3), 533 Mayo Bldg. • South Boston (27), 426 First St. • Distributors in Principal Cities.

welding company contracted to manufacture for the lift company 75 automobile cranes according to plans and specifications furnished by the lift company. Later the welding company sold to different companies several cranes which it had constructed under this contract. In addition, the welding company manufactured many cranes and sold them to former customers of the lift company.

In subsequent suit, the welding company proved that the lift company had gone out of business. Hence the higher court held the welding company not liable for any damages, and said:

"In the instant case, the uncontradicted testimony of plaintiff disclosed that he was not in business during the period when he claimed that defendant (welding company) was engaged in unfair competition. Therefore, plaintiff failed to establish one of the essential elements of a cause of action for unfair competition."

Quite obviously this decision was decidedly in favor of purchasers who received cranes from the welding company, otherwise these innocent purchasers may have been held personally liable in damages to the lift company.

This same situation may exist when the court refuses to uphold the validity of a trade mark. Under these circumstances purchasers of the trade-marked merchandise may without liability resell it.

For example, in Fruit Growers Co-op v. M. W. Miller & Company, 170 Fed. (2d) 834, the Fruit Growers Co-Operative sued the M. W. Miller and Company. The former alleged that it owns the trade-mark "Sturgeon Bay," and that the M. W. Miller and company infringed the trade-mark by placing labels bearing the name Sturgeon Bay in prominent letters on cans containing fresh or processed red sour cherries, and by selling the product so labeled in interstate and intrastate commerce.

The court held that the trade-mark "Sturgeon Bay" is merely a geographical name descriptive of the place where the cherries are produced, and, therefore, the trade-mark is invalid.

Also, the court held that the mere fact that M. W. Miller and Company prominently displayed the words "Sturgeon Bay" on its labels did not mean that it was guilty of unfair competition, since *no* convincing testimony was given that purchasers were deceived into buying one product when believing they were buying the other.

The Fair Trade Act was designed to protect the good will of manufacturers particularly when trade-marks are used in resale of goods originally owned or produced by a manufacturer. Hence, it is unlawful for a purchaser to repack products and sell at a price lower than a price advertised or contracted by the purchasers.

Manufacturer Controls Resale

For illustration, in Guerlain Company v. F. W. Woolworth Company, 74 N. E. (2d) 217, the testimony showed facts, as follows: The Guerlain Company manufactures and distributes high-grade perfumes and cosmetics under the trade-mark "Shalimar". This company made contracts with retail druggists which set a minimum resale price of $1.60 for "Shalimar" perfume in quantities of "one dram or less".

A distributor purchased "Shalimar" in the retail market and rebottled it in small glass ampules holding 1/10 of a dram. The ampules bear a label which explains that the perfume is manufactured by the Guerlain Company, and sell retail at 10 cents.

This court held that it is unlawful to sell Shalimar perfume in small 10 cent packages, because the Supreme Court of the United States established law that the purpose of the Fair Trade Act is to protect the good will of manufacturers and producers.

Hence this higher court held that it is unlawful for a purchaser to repack a manufacturer's merchandise and sell it in small quantities at a price detrimental to the manufacturer, or in violation of his established resale price.

Similar Trade-Marks

All purchasers should be very careful not to purchase goods bearing a trade-mark which infringes an older and established trade-mark. This is so because all infringers of a valid trade-mark are personally liable in heavy damages to the owner of the trade-mark.

Another important rule of law is that a trade-mark may be infringed by any new trade-mark likely to deceive the general public. Hence, the validity of trade-marks is broadly construed and a trade-mark may be held to be an infringement although it does not closely resemble the established trade-mark.

For example, in California Piece Dye Works v. California Hand Prints, Inc., 159 Fed. (2d) 871, it was shown that a manufacturer registered in the United States Patent Office its trade-mark "California Hand Prints", used for tablecloths, luncheon sets, towels, drapery and upholstery fabrics.

Soon afterwards another company, the California Dye Works, started using the trade-mark "Colorfornia" on the same type of goods.

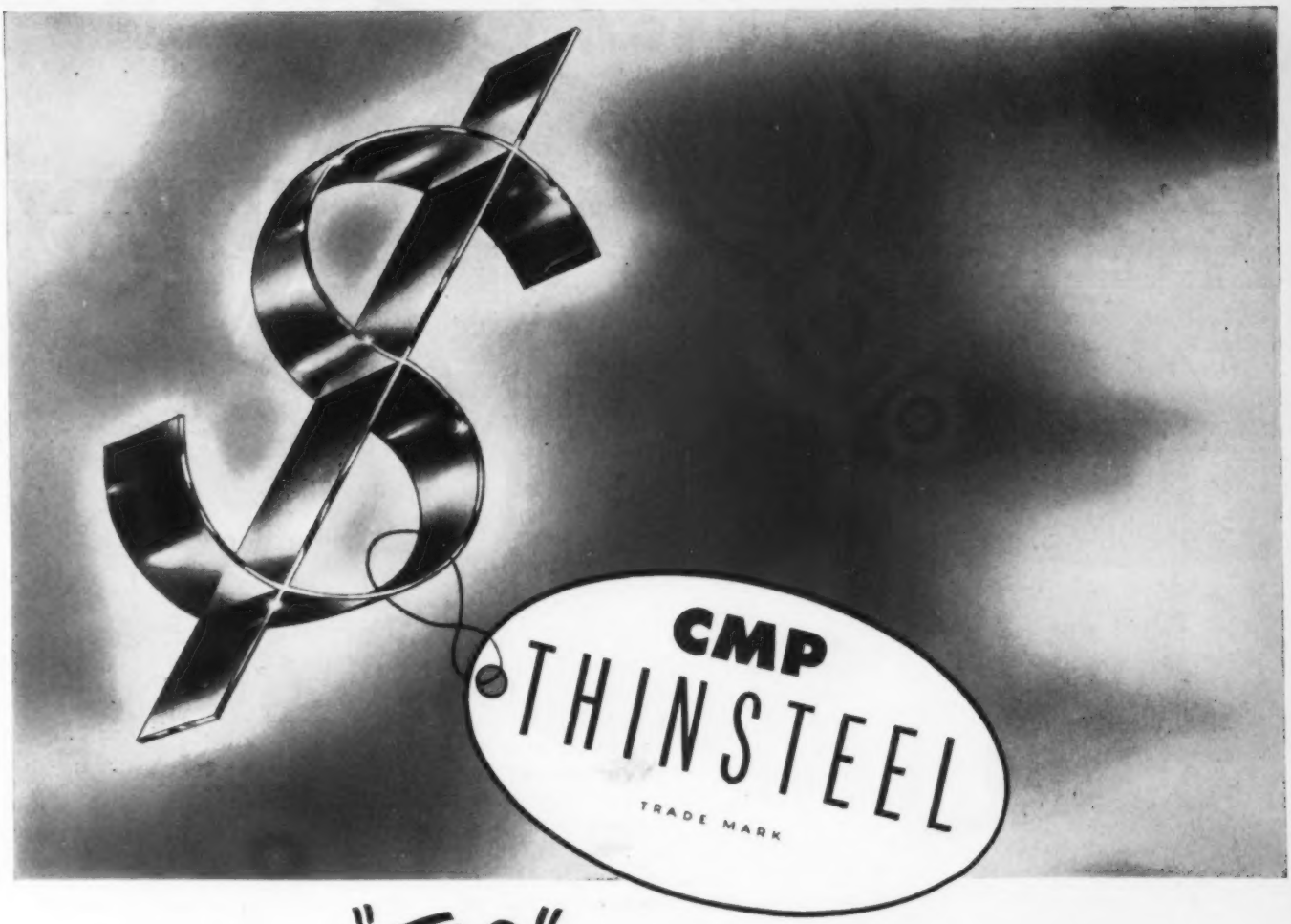
The federal court held that the latter trade-mark could not be lawfully used by the California Dye Works, saying:

"The two marks here involved are substantially the same in sound and appearance; and if such use is continued, will likely cause further confusion in the mind of the public."

Also, see American Oil Company v. Norkus, 57 Atl. (2d) 868. Here it was shown that the American Oil Company has been doing business in Pennsylvania since 1922. It sells motor oil, furnace oil and petroleum products in every state on the Atlantic seaboard and spends large sums in advertising. Since 1945, it has been also servicing oil burners in Philadelphia.

In 1945, the "American Oil Burner Service" began doing business in Philadelphia. The American Oil Company sued the American Oil Burner Service, and asked the court to grant an injunction to stop use of the latter name. The higher court granted the injunction, and said:

"By reason of the similarity of the names 'American Oil Company' and 'American Oil Burner Service' there will be a tendency to deceive and confuse the public mind."



you'll "TAG" more profits with this precision rolled strip

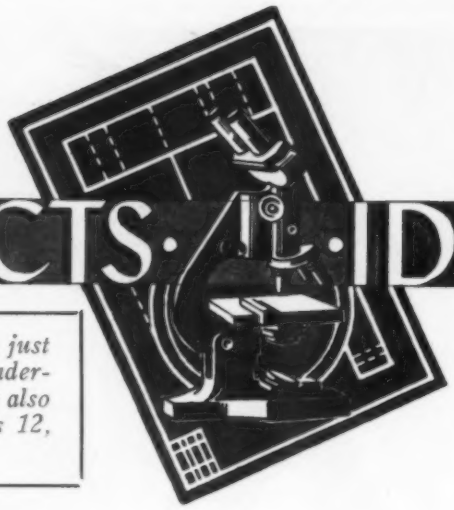
CMP Thinsteel is a genuine strip product with all the characteristics of superior accuracy to gauge, surface, finish and edge, which distinguish it from other types of cold rolled products.

You can sometimes buy cold rolled sheets slit to strip steel widths at a lower per-pound price than CMP Thinsteel—BUT, if you will total the steel weight you actually use for any given number of units, thus produced, determine the time required to produce them, including down-time for jammed dies and die changes, and check the total number of salable units which result, after allowing for rejects, we believe a comparable check on an equal weight of CMP Thinsteel will show you worthwhile savings. We shall be glad to arrange for a competitive test to be run at your convenience.

CMP the **Cold Metal Products co.**
YOUNGSTOWN 1, OHIO

NEW YORK • CHICAGO • DETROIT • ST. LOUIS • INDIANAPOLIS • LOS ANGELES

New PRODUCTS · IDEAS



If you want more information on New Products items, just list the item numbers in a letter to Purchasing Reader-Service Department on your company letterhead. This also applies to Catalogs and Bulletins described on Pages 12, 14, 16, 19 and 20. See Page 19.

Portable Shear

Stanley Electric Tools, New Britain, Conn. has a new Unishear, No. 214A, that will cut up to 14 gage hot rolled steel (other materials in proportion) at a speed of 15 to 20 feet per minute.

Stanley says the simple, improved blade motion "feeds in" the work so that little effort is required by the operator in cutting straight lines, curves, angles and notches with hairline accuracy. The universal motor is full ball and roller bearing construction. Yoke is made of special heat treated alloy steel. Motor operates on either d-c or a-c, 60 cycles or less. Voltages 115, 220, 230 or 250. Net weight of the tool is 9½ lbs.

No. 100—For further information see Page 19

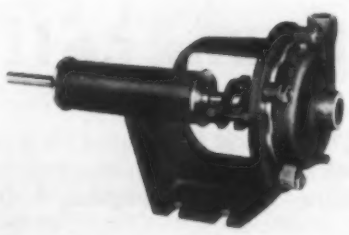
Metal Hose and Flanges

Pennsylvania Flexible Metallic Tubing Company, Philadelphia 42, Pa., thinks it has met a long time need for a tough flexible metal hose and flanges to handle highly volatile liquids and still be absolutely leakproof.

Pennsylvania says the hose will withstand pressures up to 350 lbs., and will stand up under the most severe usage to be encountered in any industry. It is claimed to have proved its worth in conveying oil, gasoline, kerosene, etc. The flanges developed for use with the new hose are known as Penflex Titepak flanges and are described as leakproof under all conditions, yet lighter in weight and lower in price than any other types previously on the market. They are said to be more rugged, temperproof and more easily handled because of simplification and lower weight factor.

No. 101—For further information see Page 19

Utility Pump

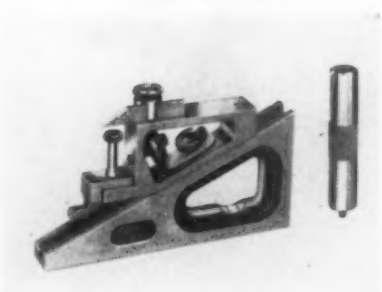


For pilot-plant operations, industrial laboratories and similar applications, Burgess-Parr Company, Freeport, Ill., offers a light weight, small capacity pump capable of handling extreme corrosive conditions.

The pump is fabricated of Illium, a corrosion-resistant alloy, and is said to be suited to the textile, paper, chemical, fertilizer, etc., industries. Its semi-open, non-clog type impeller is precision balanced to permit pump operation at speeds to 3,600 rpm. The standard pump is equipped with packing of blue asbestos fiber. Teflon and other special packings, or Illium mechanical seals are also available.

No. 102—For further information see Page 19

Precision Gage



Fine adjustment and all-round versatility are described as features of a new universal precision gage offered by The L. S. Starrett Company, Athol, Mass.

Starrett says a quick adjustment of the knurled thumb screw, with no tedious tapping of the slide, will set the gage smoothly and precisely to the exact size required, either from a micrometer, height gage, vernier caliper, or gage blocks. Thumb screw and lock nut are smaller than gage thickness, permitting gage to be used on its sides. With the scribing attachment it can be used as a surface or height gage. In all its numerous applications, flush surfaces permit use on base, end, top of slide or sides. Combination flat and "V" ways on the slide and base are form ground.

No. 103—For further information see Page 19

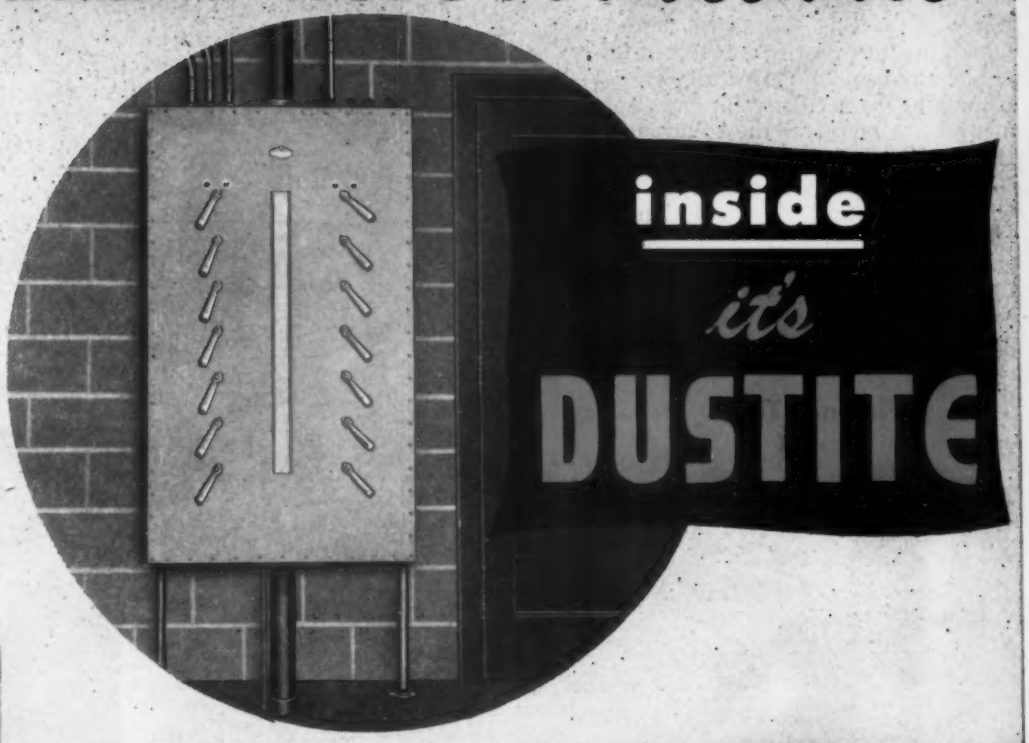
Chromium Plating Solution

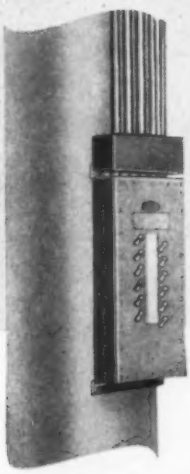
Higher quality and greater economy in chromium plating are claimed for a new solution made by United Chromium, Incorporated, 51 E. 42nd St., New York 17, N. Y.

Known as Unichrome SRHS Solution, it is said to have these advantages: faster plating; lower elec-

(*Please turn to page* 150)

No hazard here . . . *because*





Typical lighting panelboard illustrated above; typical power panelboard in circle.

Designed for use where carbon black, coal or coke dust, grain dust and other dust conditions are hazards.

Approved by Underwriters' Laboratories, Inc., for Class II, Groups E, F & G Hazardous Locations.

FOR THOSE COMPANIES plagued with the hazards of volatile dust, the Frank Adam Electric Company has designed special light and power panelboards that provide *dust-free* performance, safety and dependability . . . regardless of the external dust condition . . . because FA DUSTITE PANELBOARDS remain dust-free *inside*.

These FA DUSTITE PANELBOARDS seal out the hazards of dust by means of dust-tight welded hubs for conduit outlets . . . welded box corners . . . external mounting brackets welded to back of cabinet . . . and a solid steel front plate with gasket protection all around.

The circuits are externally operated by a dust-tight mechanism of FA design. The handles operate through dust-tight bushings and engage the regular handles on the circuit breakers *inside* the cabinet. ON and OFF positions are indicated on the front of the cabinet.

And there's no reason to get inside the cabinet because all FA DUSTITE PANELBOARDS are of the automatic circuit breaker type, which provide protection without need for replacement of any parts.

Capacities 15 to 600 amps., 250 volts AC or DC, and 600 volts AC, main lugs only, or main circuit breakers.

Avoid the hazards of dust in your light and power panelboards by making them FA DUSTITE.

Inquiries solicited . . . just address your nearest FA Representative (he's listed in Sweet's) or write for Bulletin 302.

FA TRADE MARK

Frank Adam Electric Co.

ST. LOUIS 13, MISSOURI

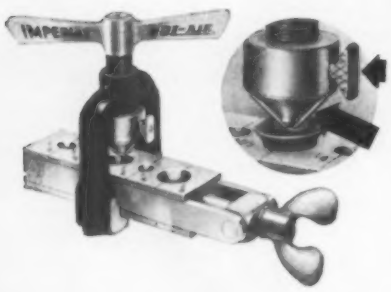
Makers of BUSDUCT • PANELBOARDS • SWITCHBOARDS • SERVICE EQUIPMENT • SAFETY SWITCHES • LOAD CENTERS • QUIKHETER

(*Continued from page* 148)

trical power costs for operation; better covering power; a wider range of plating conditions under which bright deposits are obtained; and a self regulating feature which eliminates the necessity for chemical analysis to maintain the solution at the correct plating balance. The solution may be used for all types of chromium plating. The solution is made up and maintained with but a single material, Unichrome SRHS Compound, which is dissolved in water.

No. 104—For further information see Page 19

Flaring Tool



The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill., has announced a new "Rol-Air" flaring tool which both flares and burnishes copper, brass and aluminum tubing for making up tighter and stronger S.A.E. flared tube joints.

The new tool, which has three rollers embodied in the spreader cone, is said to "roll flares in the air" since the flare is rolled out with the tubing extending above the face of the flaring block. Flares are not formed against a block, as with conventional tools. Because the flare is not formed against the die, the original wall thickness is maintained, giving a stronger flare. The tool is catalogued No. 355-F and flares ¼", 5/16", ⅜", ½" and ⅝" O.D. tubing.

No. 105—For further information see Page 19

Printing Counter

Durant Manufacturing Company, 1959 N. Buffum St., Milwaukee 1, Wis., has developed a new type counter that provides both visual and printed records of machine production. The reading line shows the quantity registered in the counter, and an upward stroke of the printing lever prints the figures on a sheet or record form.

Known as Model PVR, the counter will take a single card or multiple sheets, copies of which may be used as route or job tickets, time cards, cost cards, etc. Simple production record forms can be designed to fit special requirements. The counter is rated for speeds up to 500 counts per minute. Literature available.

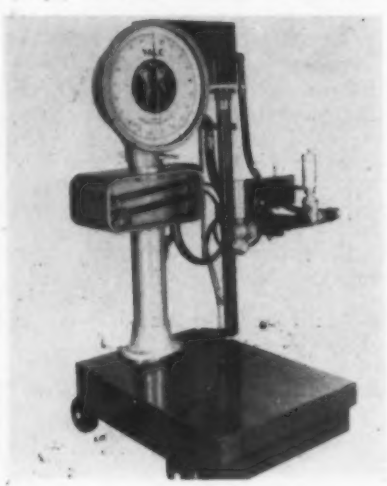
No. 106—For further information see Page 19

Push-Pull Rule

Herbrand Division, Bingham-Herbrand Corp., Fremont, O., has designed a precision push-pull rule for inside measurements. The base of the rule case measures exactly 2", which is added to the length shown on the blade. Vertical numbers are set in black on white enamel for easy reading. Balanced stay-put action is said to permit effortless push and pull of blade while assuring that it will stay at desired length. Concave blade of tempered steel will remain rigid at full 6' extended length. Total weight in metal case with lustre chrome finish is 3¼ ounces.

No. 107—For further information see Page 19

Automatic Drum Filler



A new automatic air-operated device for filling drums to the correct weight with liquids has been developed by The Yale & Towne Manufacturing Company, Roosevelt Blvd. and Haldeman Ave., Philadelphia 15, Pa.

Yale & Towne says the unit is fast, highly accurate, safe (no electrical equipment or attachments are required), and so simple that one unskilled man can handle two units. To operate, an empty drum is placed on the platform of the Yale Load King scale on which the device is mounted, and a tear beam poise is moved until the dial indicator points to net weight of material desired. The valve assembly is lowered (by air) to the drum bunghole. The start button is pushed, starting flow of liquid. The device automatically cuts off when the desired weight is reached.

No. 108—For further information see Page 19

Hack Saw Blade

Clemson Bros., Inc., Middletown, N. Y., has developed a new shatterproof hacksaw blade that is unbreakable when used in a frame. Called the Star "Molyflex", it is described as having the flexibility of the Star unbreakable special flexible plus the cutting qualities of the Star "Moly" high speed.

Clemson says a test showed that the Molyflex blades, in the least favorable performance, averaged a total depth of cut of 6.42 inches, 23.5% more metal cut than the 5.20 inches averaged by all of the other flexible high speed brands combined. The blades are available in all hand sizes and pitches. They are overall copper color, and have specifications printed on them.

No. 109—For further information see Page 19

Plastic Window Shades

New window shades made of special Vinylite plastic, manufactured by Charles W. Breneman Co., 2045 Reading Rd., Cincinnati, O., are said to surpass conventional shades in durability; finish; resistance to fire, cracking, staining, etc.; ease of maintenance. They are also more economically priced.

The shades can be thoroughly cleaned by using soap and a damp cloth or sponge. They are unaffected by moisture, mildew or insects, will

(*Please turn to page* 154)

YES, IT'S *Yoloy*

For a LIGHTER, TOUGHER STRONGER Fire Ladder

SEAGRAVE builds the ladder of its fire truck entirely of Yoloy because this high-tensile, low-alloy, nickel-copper steel is extra strong and durable. Yoloy permits lighter, more rigid construction, making possible smoother hydraulic operation of the ladder. Also, with so much dead weight eliminated, operation is faster.

Yoloy stands the abuse of extreme temperatures and shock, as well as resists corrosion and abrasion. It helps reduce maintenance and extends equipment life.

Let our representative tell you how you, too, can use Yoloy profitably in your products.

Truck and ladder fabricated by The Seagrave Corp., Columbus, Ohio; Yoloy tubing for ladder furnished by Van Huffel Tube Corp., Warren, Ohio.

THE YOUNGSTOWN SHEET & TUBE CO. 1900 YOUNGSTOWN 1950 50 YEARS OF SERVICE

Youngstown

YOLOY STEEL

THE YOUNGSTOWN SHEET AND TUBE COMPANY

General Offices — Youngstown 1, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel

Export Office - 500 Fifth Avenue, New York

SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES - CONDUIT - PIPE AND TUBULAR PRODUCTS - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS.

Everywhere

...the sign of Added Values

High on a California mountain, a great telescope mirror is eased into position—by a P&H Overhead Crane.

Deep in the Canadian wilds, the first dipperful of earth is stripped from a vast iron range—by a P&H Electric Shovel.

Across the Texas plains . . . magic! . . . a smooth, new road is fashioned from the soil—by a P&H Soil Stabilizer.

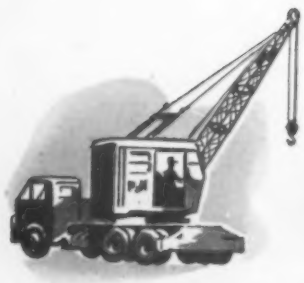
Yes, you see the familiar P&H everywhere . . . on the machines that dig industry's materials . . . move its loads . . . build its plants . . . assemble its products . . . it is the sign of Added Values!

Always there, these values are the proof of P&H *Quality* . . . the pride of P&H *Service*. As much as the familiar sign itself, they have been a part of every P&H product since 1884.

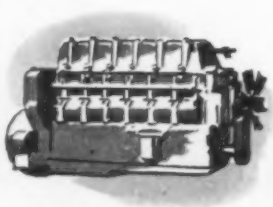
P&H

QUALITY
FOUNDED IN 1884
SERVICE

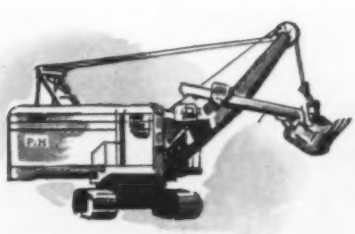
HARNISCHFEGER
CORPORATION
4577 W. National Ave. Milwaukee 14, Wis.



TRUCK CRANES



DIESEL ENGINES



EXCAVATORS

HOMES

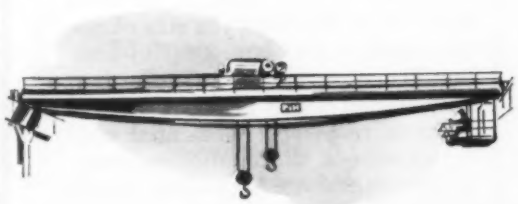
P&H

PORT WASHINGTON, WISCONSIN

PORT WASHINGTON, WISCONSIN

MILWAUKEE, WISCONSIN

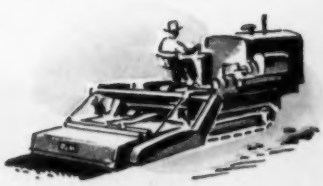
MILWAUKEE, WISCONSIN



OVERHEAD CRANES

ELECTRIC HOISTS

WELDING EQUIPMENT

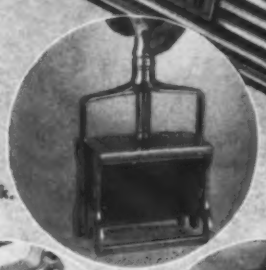


SOIL STABILIZERS

You can save money and eliminate waste motion 3 ways with

Krengel's Interchangeable Rubber Base-Lock Type

HAND STAMP illustrated shows how all sizes of Base-Lock type fit easily into the rubber channels. Always automatically in perfect alignment giving superior reproduction. Write for free sample.



SELF-INKER for hi-speed work.

COMMERCIAL PRINTING PRESS cuts outside printing costs to the bone.

ROLLER MARKER for heavy-duty service in shipping dept. and warehouse.

Frequent changes make permanent stamping and marking devices impractical

Revolutionary Krengel Base-Lock Type and accessories

- **Cut hours off marking and stamping operations.**
- **Save money by using only ONE stamping device instead of 3, 4, or 5.**
- **Eliminates marking errors by reducing multiple operations to just ONE.**

With new, patented Interchangeable Base-Lock Rubber Type different type faces and numbers of various sizes align perfectly in rubber channels on our wide assortment of marking machines and stamping devices. No sliding of type or irregular and uneven spacing. No old tin slot or track holder system. Press slightly with one finger and the type locks automatically into the grooved rubber surface. Takes just seconds to change copy. A tremendous saving of time, money and inconvenience for every business.

WRITE FOR COMPLETE CATALOG

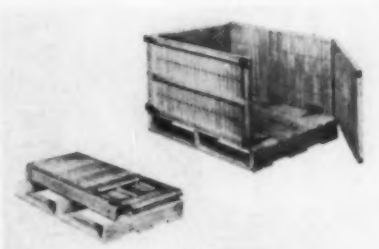
KRENGEL MANUFACTURING CO., INC.
227 FULTON ST., NEW YORK 7, NEW YORK
CORTLANDT 7-5714

(*Continued from page* 150)

not tear or puncture in normal use and do not support flame. The plastic material, made by Bakelite Corporation, is resistant to fading, cracking, shrinking and staining, does not ravel and has no filling to break or fall out. They are available in ivory, white, green and tan. Stock shades are made in 36″, 42″ and 48″ widths and 6′ and 7′ lengths.

No. 110—For further information see Page 19

Folding Container



A heavy-duty woven wood-and-wire container that folds to one-quarter its setup size to save space is a new product of the G. B. Lewis Company, Watertown, Wis.

Side and end panels of the folding box are attached to the solid wood bottom with heavy gage steel hinges. When unfolded to an upright position, strong tension fasteners at the corners hold the panels rigidly in shape. Bottoms are available in the single or double face-pallet-type or with stacking skids. When full, the boxes may be stacked ceiling high and may be handled singly or in multiples with fork trucks. All wood parts are of tough northern elm.

No. 111—For further information see Page 19

Connection Box

Russell & Stoll Company, Inc., 125 Barclay St., New York 7, N. Y., has announced its "U-Pul" connection box, described as an efficient and economical pull point for wire sizes ranging from No. 12 to 1,000 MCM at 600 volts.

The design is said to require no bends in the cable, thereby eliminating the necessity for using large sized enclosures as required by the N.E.C. This provides a compact device less than half the size of the conventional pull box. Depth of the housing is in the cover, affording unrestricted working space when the cover is removed. Substantial gaskets insure a thoroughly weatherproof installation, according to the maker.

No. 112—For further information see Page 19

(*Please turn to page* 156)

For Vital Control Circuits in Curtiss Electric Propellers

IT'S BENDIX-SCINTILLA ELECTRICAL CONNECTORS

THE FINEST MONEY CAN BUY

CHECK THESE ADVANTAGES

- Moisture-proof
- Radio Quiet
- Single-piece Inserts
- Vibration-proof
- Lightweight
- High Insulation Resistance
- Easy Assembly and Disassembly
- Fewer Parts than any other Connector
- No additional solder required

Unfailing dependability is the standard set by Curtiss propellers and American Air Lines in their selection of equipment.

Bendix-Scintilla is therefore the logical choice for the electrical connectors in the Curtiss Electric propellers on American Flagships.

In fact, wherever circuits must be arranged to connect and disconnect with ease and certainty Bendix-Scintilla is the choice.

Remember whenever there is no compromise with quality—it pays to specify Bendix-Scintilla electrical connectors—the *finest* money can buy.

Write our Sales Department for detailed information.

BENDIX SCINTILLA

SCINTILLA MAGNETO DIVISION OF

Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, New York

Gold Stripe BRUSHES

guarantee better all-around painting performance for your plant

1. Top-grade, straightened, pure bristle selected to give maximum carrying capacity.
2. Constant bristle formula developed by master craftsmen with painstaking care to insure longer wear, greater efficiency and true economy.
3. Proper taper for smoother application and cleaner trim.
4. Riveted steel ferrule (originated by Pittsburgh) combine fine hardwood handle and the right bristle into a long-life team.
5. Especially designed handle to give the perfect balance that means easy handling; saves wrist and arm strain.
6. Life Saver Jacket of new, improved fiber keeps brush lively, straight and clean.
7. The Gold Stripe is your guarantee of better, faster paint jobs every time, because all brushes are designed as a unit under job-tested conditions by master painters.

You can depend on Pittsburgh's Complete Line of Brushes

Whatever you need in brushes, you can always rely on Pittsburgh, the most complete industrial brush line.

For Painting . . . you can choose from the most famous name in brushes, Gold Stripe (illustrated here) or from Pittsburgh's time-tested and proved Neoceta brush lines.

For Maintenance . . . Pittsburgh's brush-making know-how comes up with the famous Lightning Line of staple-set sweeps and scrubs (shown in illustration.) They have no peer for long, hard usage.

Write for complete information, or contact one of our conveniently-located branch warehouses for fast, efficient service. PITTSBURGH PLATE GLASS COMPANY, *Brush Division*, Dept. M-3, 3221 Frederick Avenue, Baltimore 29, Maryland.

Lightning Line Staple Set Brushes

SWEEPS

SCRUBS

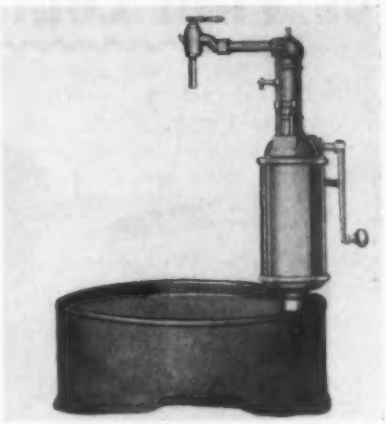
DUSTERS

PITTSBURGH Gold Stripe BRUSHES FOR INDUSTRY

BRUSHES • PAINT • GLASS • CHEMICALS • PLASTICS

PITTSBURGH PLATE GLASS COMPANY

Barrel Pump



Phillips Pump and Tank Company, Cincinnati 9, O., has designed its Model 174 gallon stroke barrel pump especially for handling thin lubricants and coolants. It is threaded for 1½" and 2" drum openings.

The pump is equipped with a plunger type shut-off nozzle. The cylinders are lead seated; no gasket replacement is necessary during the life of the pump. It has an adjustable suction with built-in foot valve. Model 174 can be supplied with a flat base that fits any tank with an opening up to 7½" diameter. It is also made for use with a skid tank. When required, the pump is available with an 8' ¾" gasoline hose, couplings, nozzle, vacuum breaker, hooded hose socket or hanger, and a brass foot valve with or without a suction tube.

No. 113—For further information see Page 19

Sound-Proof Intercom Booth

Executone, Inc., 415 Lexington Ave., New York 17, N. Y., has brought out a new sound-proof booth, M-15, for use where its master or staff stations are located in high noise level areas.

Executone says a two-way conversation between a quiet location and a noisy one can be carried on clearly and intelligibly because of the ability of the new booth to ab-

(*Please turn to page* 158)

GUARD THAT **Factory-Fresh**

APPEARANCE

with

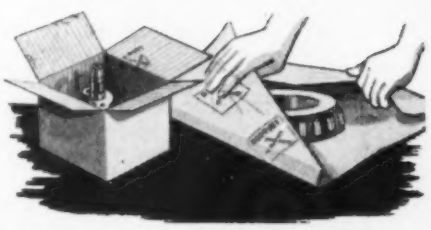
NOX-RUST

WRAPOR

VAPOR

CHEMICALLY BLANKETS STEEL FROM RUST BY RENDERING MOISTURE NON-CORROSIVE

- **PREVENTS RUST**
- **SAVES $ $ $ $ – in LABOR and Packaging Material**



AVAILABLE IN CARTONS, SHEETS, ROLLS

Nox-Rust Vapor Wrapper gives full, lasting protection against rust when your product is wrapped in Nox-Rust treated paper or packed in a Nox-Rust treated chipboard or corrugated carton. An invisible chemical vapor permeates the air spaces in the package, yet leaves no deposit on the metal itself.

***Write* FOR LITERATURE and PRICES**

When moisture threatens the appearance or utility of your metal products, put NOX-RUST Vapor Wrapper on guard! This amazing new paper, impregnated with a magical chemical, simplifies packaging, yet offers complete protection against corrosion with remarkable savings in time and money! NOX-RUST Vapor Wrapper releases an invisible vapor—NON-TOXIC and ODORLESS—which robs moisture of its corrosive effects. Eliminates oily or greasy coatings—delivers your product clean and ready for use.

Manufactured only by

NOX-RUST CHEMICAL CORPORATION

America's Foremost Manufacturer of Rust Preventive Products

2431 So. Halsted Street, Chicago 8, Illinois

DETROIT • SAN FRANCISCO • WASHINGTON • BALTIMORE

IMPORTANT! The chemical* used to impregnate NOX-RUST Vapor Wrapper is the result of 5 years of research by NOX-RUST laboratories and has no relation through license or otherwise with any similar product now on the market.

***Patent Applied For**

National SANITARY SUPPLY ASSOCIATION MEMBER

Wall Cleaners
Fungicides
Hand Soaps
Vacuum Cleaners
Moth Exterminators
Disinfectants
Toilet Tissue
Window Cleaners
Soap Powder
Floor Wax, all kinds
Detergents
Pails
Floor Treatments
Paper Napkins
Furniture Polish
Soap Flakes
Exterminators
Mops, all kinds
Stain Removers
Carpet Sweepers
Floor Scrub Machines
Toilet Bowl Cleaners
Sanitizing Agents, Etc.
—Everything for better cleaning.

The *specialized* knowledge and experience of the janitor supply house displaying the National Sanitary Supply Association Emblem will prove helpful to you in the proper selection and use of the latest and most efficient equipment and supplies for speeding up your cleaning, maintenance and sanitation program. Proper supplies, equipment and methods *definitely* reduce cleaning costs!

BUY WITH CONFIDENCE from the Janitor Supply House Displaying the N.S.S.A. Emblem

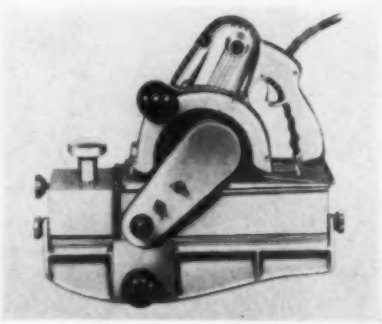
NATIONAL SANITARY SUPPLY ASSOCIATION
(INCORPORATED NOT-FOR-PROFIT)
National Headquarters: 139 North Clark Street, Chicago 2, Ill.
Leo J. Kelly, Executive Vice President

(*Continued from page* 156)

sorb a high percentage of the background shop noises. The unit can also be used in conjunction with dictating machines, sound system microphones and other makes of intercom systems. Made of wood, it is lined with acoustic insulation board and is 13½″ high, 13½″ wide and 13½″ deep.

No. 114—For further information see Page 19

Planer-Saw



A 4″ planer that is quickly convertible into a 6″ portable saw is the latest product of Cummins Portable Tools, Division of Cummins Business Machines Corp., 4740 Ravenswood Ave., Chicago 40, Ill.

The planer can be used for surface, door, or bevel planing, and will plane with or across the grain. Adjustment for depth of cut—to 3/16″ in wood,—is said to be accurate and easy. Three removable cutting knives can be sharpened easily. The bevel attachment has a safety guard which protects the operator from the cutter head. The unit weighs 20 lbs.

No. 115—For further information see Page 19

Coolant Base

Safco 770 Compound, with the consistency of a liquid paste, combines in a single water-soluble product all the essential qualities of a grinding compound and a sulphurized cutting oil, according to Swan-Finch Oil Corporation, RCA Building, New York 20, N. Y.

When the compound is used in grinding operations and mixed with water in ratios as high as 80 to 1, the compound will prevent wheel-loading; reduce wheel-dressings; keep work from rusting; and keep solutions sweet and free of foul odors, it is claimed. In machining operations solutions are said to exhibit the same lubricating and anti-weld properties of sulphurized oils —without smoke, odor, dermatitis or burnt hands.

No. 116—For further information see Page 19

(*Please turn to page* 160)

OIL
WITH A FULL STREAM
OR ONE DROP
USE AN EAGLE HYDRAULIC PUMP OILER
fitted with the (cm) Control Measure

The Eagle Hydraulic pump oiler is in great demand where oil must be delivered in a full stream or drop by drop . . . under perfect control.

The quantity is controlled by the easily adjusted control measure on the thumb lever, with the position of the lever and handle enabling the operation to force oil in at any angle.

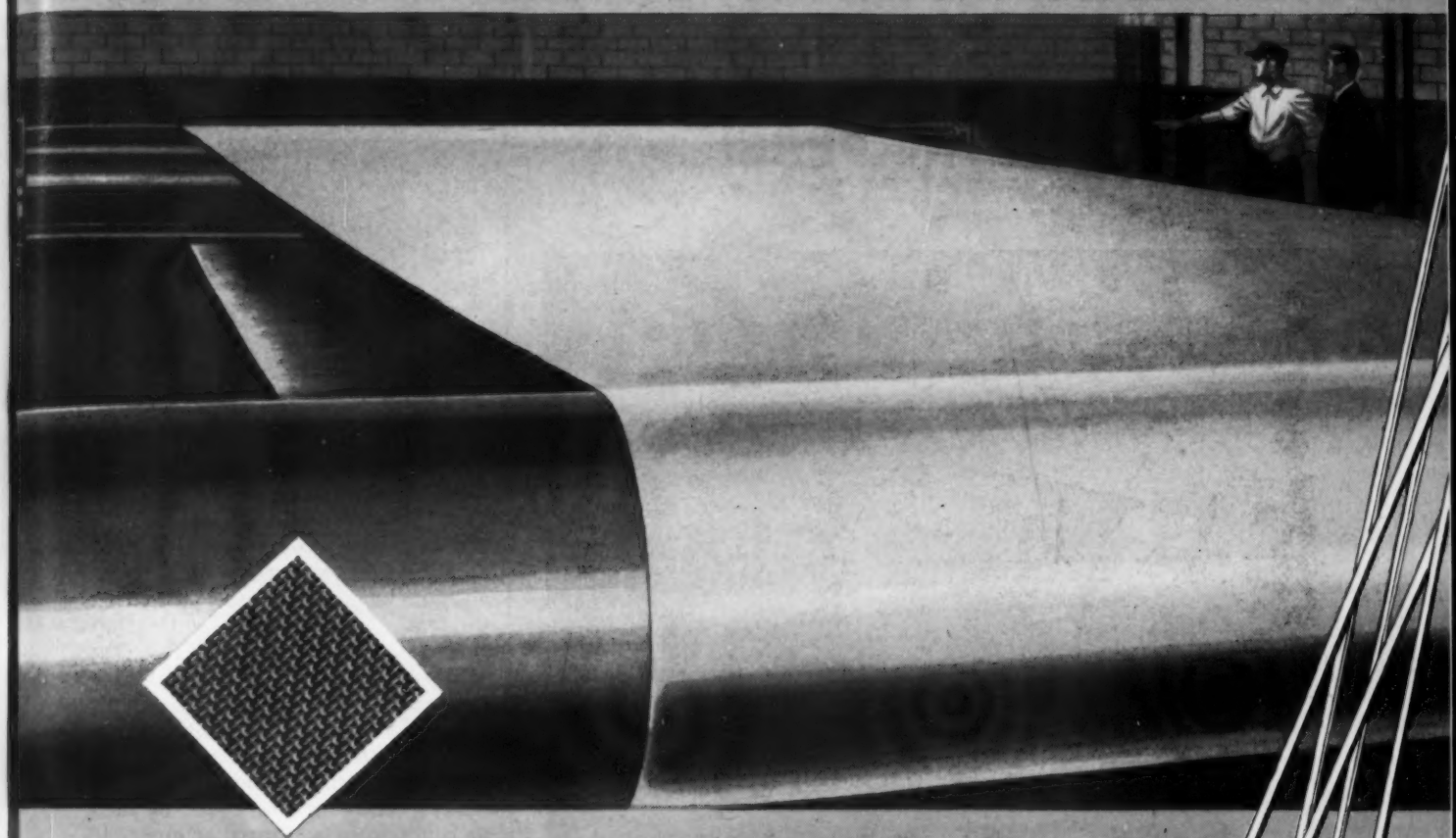
Used by mechanics, millwrights, in mills, mines, factories and foundries. ¾, 1, and 2 pint capacities. Guaranteed against leakage.

Order from your distributor
EAGLE MANUFACTURING CO.
Dept. P25 Wellsburg, West Virginia
"Oil with an Eagle Oiler"

CLARK
QUALITY INDUSTRIAL FASTENERS SINCE 1854
BOLTS
NUTS
RIVETS
and SCREWS
Uniformity of Quality . . . Accuracy of finish — explains why those who want the BEST say CLARK.

CLARK BROS BOLT CO.
MILLDALE CONN.

RIVERSIDE TAUGHT THIS WIRE TO STRETCH ITSELF AND CARRY TONS OF CORROSIVE PULP



Wire almost as fine as human hair forms the Fourdrinier screens that carry pulp in paper manufacture.

Manufacturers of this wire, from which the screens are woven, had a great deal of trouble at one time because the stock supplied to them for drawing varied widely in composition and properties. The eventual result was breakage in the loom, excessive wear and lowered resistance to abrasion in service.

So they came to Riverside.

Riverside tackled the job, developed a phosphor bronze alloy to meet requirements. This particular alloy is notoriously difficult to make but Riverside found a way to control uniformity within very narrow limits. Result:—No premature breakage of the wires in weaving, negligible effects from abrasion and fatigue, and maximum resistance to abrasion.

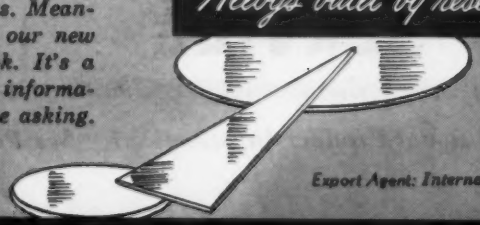
This same meticulous analysis and processing can help *you* with your *Phosphor Bronze*, *Nickel Silver*, *Cupro Nickel* and *Beryllium Copper* problems. In cooperation with your technicians, Riverside specialists will review specifications and fabricating methods; test chemical, physical and metallurgical properties; examine the entire case history of your product; *recommend a specific solution*. And finally, we'll produce your alloy—standard or special—from raw materials to finished stock, and warrant it to meet your specifications.

If there's an alloy puzzle on your desk—or around next week's corner—send the case history to us. Meanwhile, be sure to ask for our new pocket-size Alloy Handbook. It's a mine of non-ferrous alloy information, and it's yours for the asking.

RIVERSIDE ALLOYS

Alloys built by research, proved by use

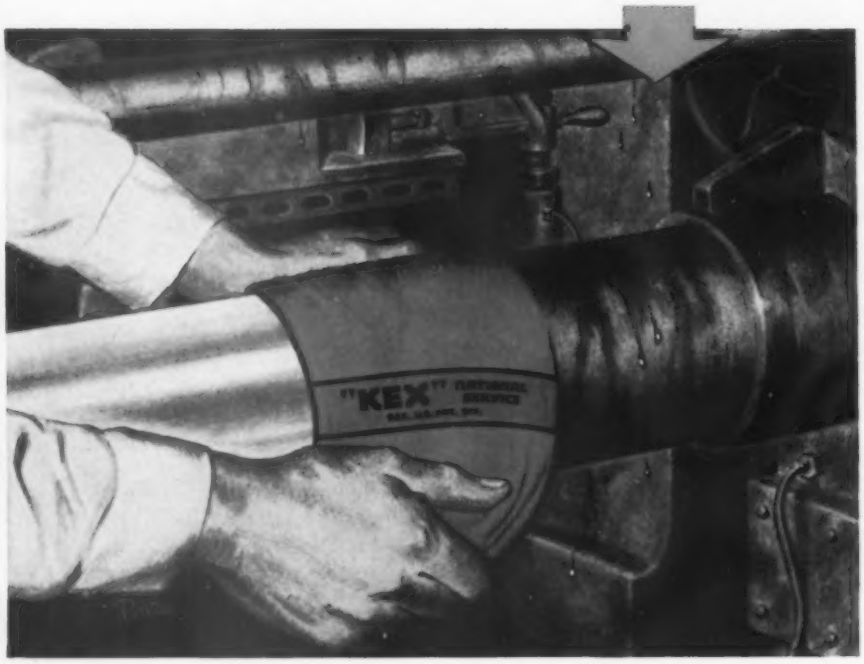
phosphor bronze
•
nickel silve
•
cupro nick
•
beryllium copper



THE RIVERSIDE METAL COMPANY
Riverside, New Jersey
Newark, N. J. • Cleveland, Ohio • Chicago, Ill.
Hartford, Conn. • Rochester, N.Y. • Detroit, Mich.

Export Agent: International Brass & Copper Co., Inc., 52 Broadway, New York C

KEX INDUSTRIAL WIPING TOWELS OFFER YOU THIS BETTER WAY TO SOLVE WIPING PROBLEMS!



- **SUPER-ABSORBENT,** and scientifically cleansed to reduce the possibility of infection.
- **SOFTER**—Woven of thirsty cotton—especially for their job—with no harsh abrasives to mar surfaces.
- **SAFER**—Bound at edges . . . no loose ends to get caught in moving machinery!
- **MORE CONVENIENT**—Made in uniform size, every inch usable, packed in easily stored bundles.
- **MORE ECONOMICAL**—No waste. Nothing to buy—no expensive inventory—just a low monthly rental.

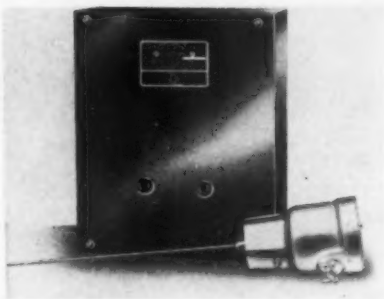
Better All 'Round—Wherever there's an industrial wiping problem, KEX wipes it out! Regular pick-up and delivery. See your classified telephone directory for nearest KEX distributor, identified by this trademark.

Or for details write
KEX INDUSTRIAL SERVICE
295 Fifth Avenue, New York 16, N. Y.

"KEX" REG. U.S. PAT. OFF. NATIONAL SERVICE — INDUSTRIAL WIPING CLOTHS

"KEX" REG. U.S. PAT. OFF. NATIONAL SERVICE

Combustion Safeguard

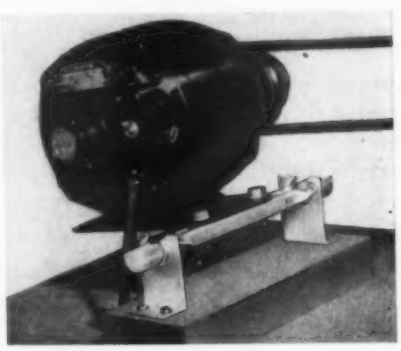


Protection against gas explosions during the ignition, operation and shut-off of gas-fired furnaces, ovens, dryers, etc., is afforded by the Electronic Pyrotrol manufactured by The Bristol Company, Waterbury 91, Conn.

Bristol says the unit performs all the operations of lighting a gas appliance that are recommended for absolute safety. If the operation fails at any step, the lighting up cycle stops and closes any valve that has been opened. If the power supply fails, the entire system is shut down. The safeguard shuts off all gas, lights signal, sounds alarm and makes relighting impossible if any tube or relay in the Pyrotrol fails to function in a normal manner. It comes in six models for various requirements.

No. 117—For further information see Page 19

Small-Motor Mount



Vermont Woodworker Co., Bennington, Vt., is marketing a mount for small motors up to 1 hp which it says will help you get more from your motors and belts.

The motor is hinged to the front of the base, allowing part of the weight to be taken up by the belt. The motor is actually locked in place, yet by rotating it to a vertical position, it can be readily removed. The rotation principle, it is claimed, permits quick speed change, uniform belt tension, uniform power.

(*Please turn to page* 166)

IN EMERGENCY OPERATIONS lights must not fail. To assure dependable lighting, at all times, many hospitals are equipped with Exide Emergency Lighting—a safe, sure source of power that's also used in many schools, theaters and other buildings where crowds gather.

KNOCK 'EM DOWN is the way wreckers do it today . . . with a hefty iron ball swung by the boom of a crane. Many big cranes, bulldozers, trucks and other huskies used for demolition and construction depend on powerful Exide Batteries to crank their hard-to-start Diesel engines.

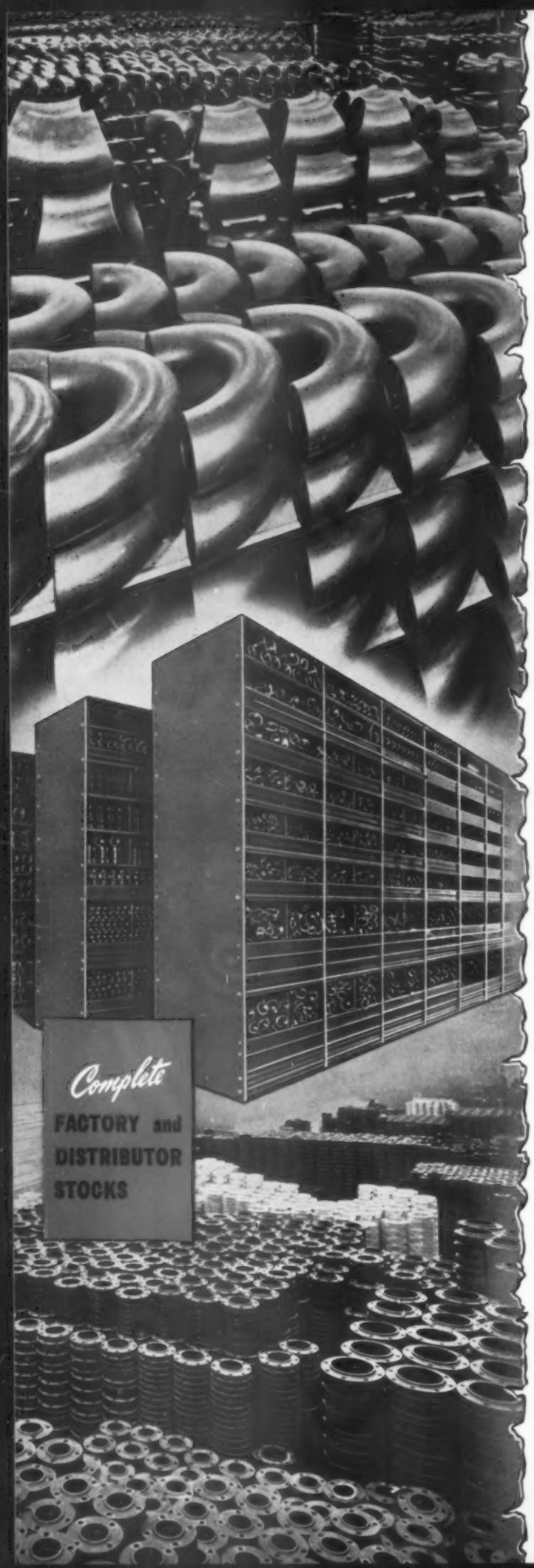
FIRE-FIGHTING is always a race against time. An important time-saver is the fire alarm system. It *must* work at all times. Many Exide Batteries are used in this service, plus thousands of others for starting fire-fighting equipment.

HIGH TENSION. Hot wires above. Cold earth far below. A hard climb between. But it's all in the day's work for the men who maintain electric power lines. In the central station that feeds these lines, many Exide Batteries are used for vital operations.

Exide Batteries serve you night and day wherever you are. Practically every type of product is handled by Exide-powered battery electric trucks. Coal used by industry, railroads and in homes is moved underground by mine locomotives, trammers and shuttlecars powered by Exide Batteries. Railways use Exide Batteries for car lighting, air-conditioning, Diesel locomotive cranking, signal systems. Many thousands of Exides are used in telephone and telegraph service, in radio and television broadcast, in aircraft, on ocean vessels. And on millions of cars, trucks and buses, they daily prove that "When it's an Exide, you start."

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

Exide* **BATTERIES HAVE PROVED THEIR DEPENDABILITY IN VITAL SERVICES FOR 62 YEARS.** **Reg. Trade-mark U.S. Pat. Off.*



all three on one order from Ladish

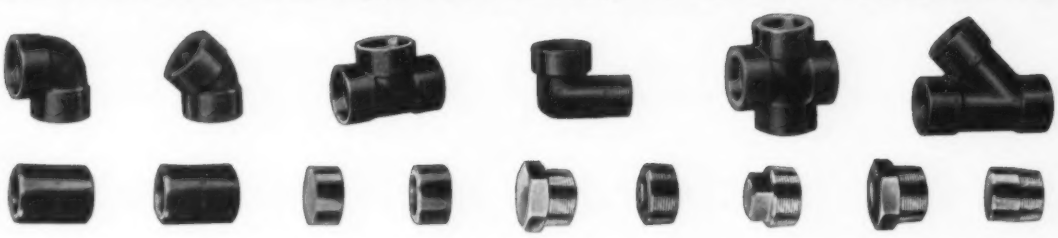
TO MARK PROGRESS

every piping system deserves the protection

SEAMLESS WELDING FITTINGS—½ INCH THRU 30 INCHES

FORGED STEEL FLANGES—½ INCH THRU 30 INCHES—LARGE O.D. THRU 96 INCHES

FORGED STEEL FITTINGS—SCREWED AND SOCKET WELDING—⅛ INCH THRU 4 INCHES



All Available in

CARBON
ALLOY
STAINLESS STEELS
ALUMINUM
COPPER & OTHER
NON-FERROUS
METALS

Means savings in time and dollars...for LADISH offers you a complete line backed with adequate stocks

Whatever your fitting requirements . . . you can rely on the Ladish line for an unrestricted selection of Seamless Welding Fittings, Forged Steel Flanges and Forged Steel Fittings.

This Controlled Quality line is complete in types, size ranges and materials you need for virtually any application. Ladish also gives you such outstanding engineering developments to improve piping efficiency, as Seamless Reducing Elbows and Full Branch Taper Design Tees.

Adequate stocks in strategically located distributor warehouses . . . supplemented by extensive factory inventories of every type . . . give you double assurance of prompt service on every Ladish order. And, by standardizing on Ladish you know that every fitting is made to the unsurpassed standards of Controlled Quality for complete dependability.

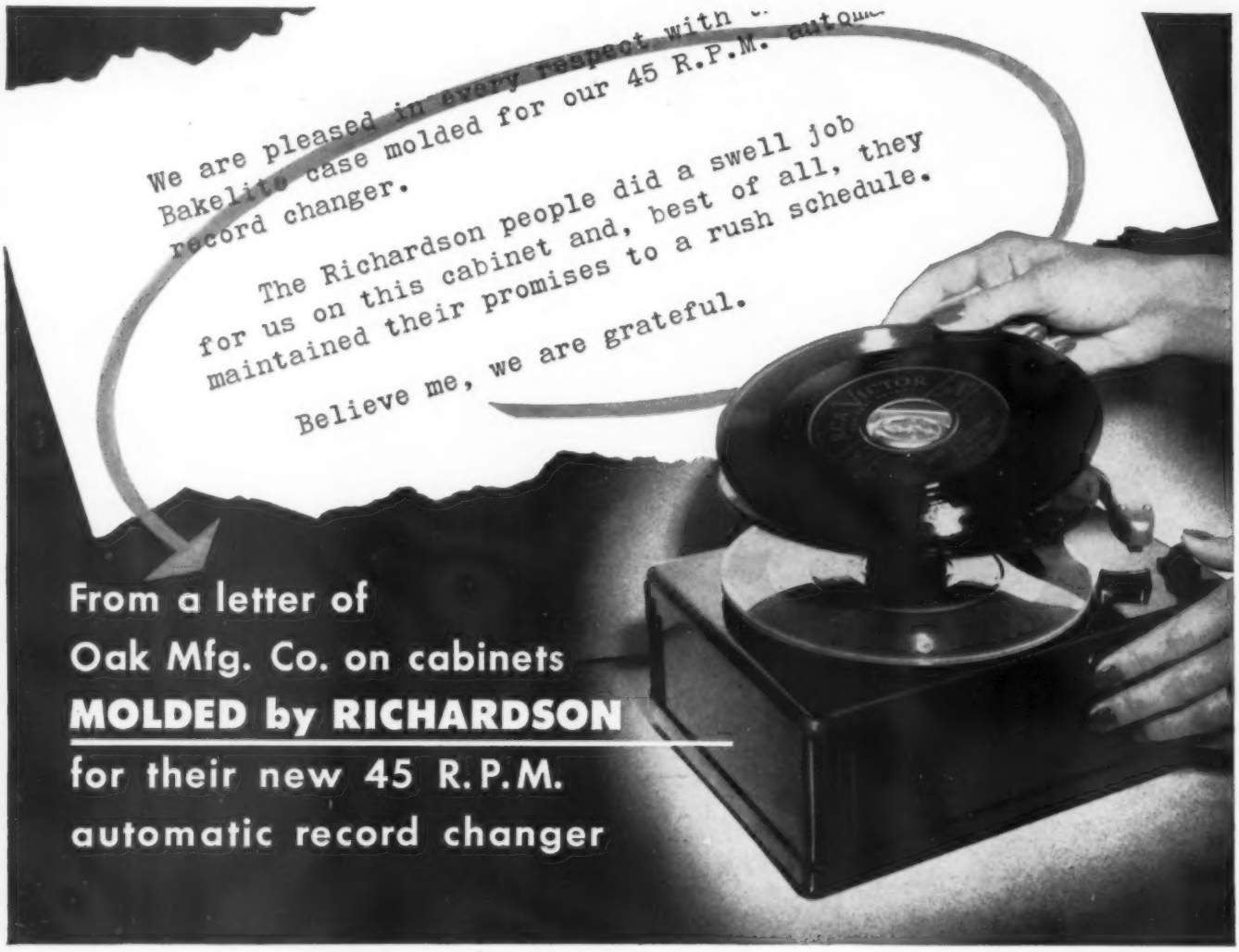
of *Controlled Quality* fittings

A COMPLETE LINE PRODUCED UNDER ONE ROOF
. . . ONE RESPONSIBILITY

LADISH CO.

CUDAHY, WISCONSIN
MILWAUKEE SUBURB

DISTRICT OFFICES: New York • Buffalo • Pittsburgh • Philadelphia
Cleveland • Chicago • St. Louis • Atlanta • Houston • Los Angeles


We are pleased in every respect with
Bakelite case molded for our 45 R.P.M. automa
record changer.
The Richardson people did a swell job
for us on this cabinet and, best of all, they
maintained their promises to a rush schedule.
Believe me, we are grateful.
From a letter of
Oak Mfg. Co. on cabinets
MOLDED by RICHARDSON
for their new 45 R.P.M.
automatic record changer

RICHARDSON MOLDING SERVICES

This sturdy record changer cabinet, molded by Richardson for Oak Mfg. Co., is only one of thousands of parts Richardson has molded efficiently, economically and on time for scores of manufacturers.

These cabinets come from the molds with a smooth, attractive finish that makes further finishing operations unnecessary.

Richardson experience in molding plastics produced this cabinet with tapped machine screw holes accurately spaced for quick, easy assembly. Also, Richardson experience pointed the way to produce the job at minimum cost.

Hundreds of manufacturers have found that Richardson's extra experience, extra facilities and extra know-how have paid important dividends. May we discuss with you your next plastic molding job?

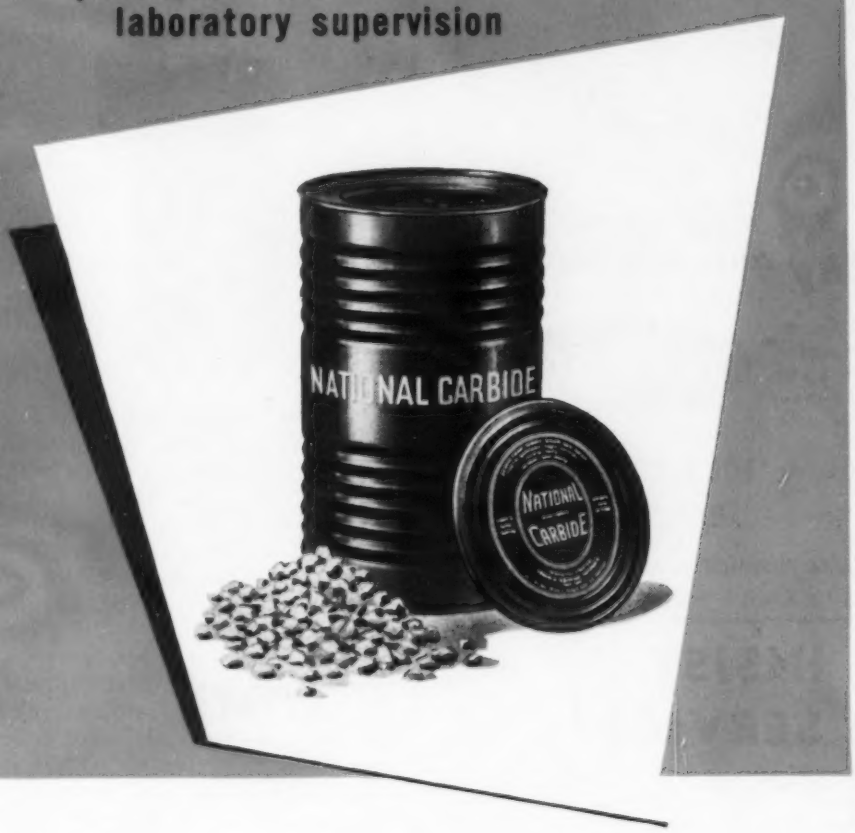
INSUROK by RICHARDSON
Dependable names in plastics

The RICHARDSON COMPANY
GENERAL OFFICES: LOCKLAND, OHIO FOUNDED IN 1858
Sales Headquarters: MELROSE PARK, ILLINOIS

CLEVELAND • DETROIT • INDIANAPOLIS • MILWAUKEE • NEW BRUNSWICK, (N. J.) • NEW YORK • PHILADELPHIA • ROCHESTER • ST. LOUIS

For high acetylene yield . . . specify National Carbide

produced under laboratory supervision



Rigidly controlled and tested during manufacture . . . and produced from the finest lime and coke available, "*National Carbide*" (meeting all Federal Specifications) assures every customer an exceptionally high acetylene yield per pound of carbide — a minimum 4½ cu. ft. This high quality, plus careful adherence to a special packaging technique accounts for "*National's*" wide acceptance as the Carbide producing maximum acetylene production . . . at lowest operating cost.

Also, and of vital importance to you, no matter where your plant is located, "*National Carbide*" can be obtained in any quantity from a nearby Airco office, authorized dealer, or warehouse.

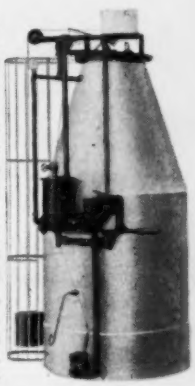
For more information about this top-grade product, write your name and address on the margin below, and send it to your nearest Airco office or authorized dealer for a copy of Catalog 30.

★ ★ ★

Air Reduction supplies Oxygen, Acetylene and other industrial gases . . . Carbide . . . and a complete line of gas cutting machines, gas welding apparatus and supplies, plus arc welders, electrodes and accessories. Ask us about anything pertaining to gas welding and cutting, and arc welding . . . we'll be glad to help you.

More news about AIRCO products

STATIONARY ACETYLENE GENERATORS



Airco's 300 pound (double rated — 600 cu. ft. per hr.) and 500 pound (double rated — 1,000 cu. ft. per hr.) stationary acetylene generators are suitable for operating all types of welding or cutting torches.

Automatic in principle, these generators feature hot galvanized shells — inside and out, with all welded seams. Operating parts have been reduced to a minimum — and are easily accessible for inspection or repair.

Also included as standard equipment are "protectomotor filters" to entrap suspended lime, and prevent clogging acetylene pipe lines, regulators and torches.

PORTABLE ACETYLENE GENERATORS

The Airco Type "P" portable actylene generator is designed and constructed for efficiency, convenience, dependable and low-cost operation . . . and requires little attention other than draining and refilling with carbide and fresh water. Other features include:

—Quick, easy charging
—"Air Lift" principle of water circulation
—Glass viewing window in carbide hopper
—Simple and conveniently located controls
—Large-size sludge agitator and valve for complete and fast sludge removal.

Made in three sizes, each approved for double-rated operation: 15-lb. size, 30 cu. ft. per hr.; 30-lb. size, 60 cu. ft. per hr.; and 50-lb. size, 100 cu. ft. per hr.

All Airco generators conform with the specifications of Underwriters' Laboratories and Factory Mutual.

AIRCO AIR REDUCTION
Offices in Principal Cities

Rugged and Ready —for the toughest mass handling jobs!

Towmotor's exclusive one-piece, all-steel frame construction provides an unusually sturdy unit—*extra* rigid for rugged service, *extra* easy to inspect and maintain. That's why Towmotors *stay* on the job dependably . . . even in 24-hour daily service. See why Towmotor's rugged features make every Mass Handling job easier, faster, safer. Write for a copy of "Handling Materials Illustrated." Towmotor Corporation, Division 11, 1226 E. 152nd St., Cleveland 10, Ohio. Representatives in all Principal Cities in U. S. and Canada.

TOWMOTOR
THE ONE-MAN-GANG

FORK LIFT TRUCKS and TRACTORS

every handling job is easier with TOWMOTOR MH!

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

more than **80** Oakite Materials to solve your cleaning problems

INSIST on SERVICE!

HE is a wise man who demands service with every cleaning compound he buys. He knows that it's the *service behind the product* that makes the difference between economy and waste. Before you place your order see what Oakite offers in the line of service:

- **the personal help of over 200 trained technicians**
- **wide variety of acid, alkaline materials**
- **chemical and mechanical testing laboratories**
- **handy warehouse stocks for prompt delivery**
- **free technical bulletins, digests, booklets**

Want to put this service to work for you today? Just call or write Oakite Products, Inc., 54 Thames St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in Principal Cities of United States and Canada

(*Continued from page* 160)

It takes up belt stretch and permits the use of one motor, pulley, belt switch and cord for several machines. The supporting brackets provide an end bearing, maintaining belt alignment and reducing vibration.

No. 118—For further information see Page 19

Drum Pump

Lincoln Engineering Co., 5783 Natural Bridge Ave., St. Louis 20, Mo., has announced a new Centro-Matic electric-motor operated drum pump, Model 1837, for use with original 55-gallon barrels or 400 lb. drums in conjunction with its centralized single line lubrication systems.

The pumps are for use with Lincoln systems where compressed air is not available, or where electrically powered and controlled equipment is preferable. They include, as standard equipment, control panel with time clock adjustable for time-frequency settings, pressure switch, and signal alarm. Flanged steel drum cover provides support for the pump, protection for the lubricants. Bulletin 800-1 available.

No. 119—For further information see Page 19

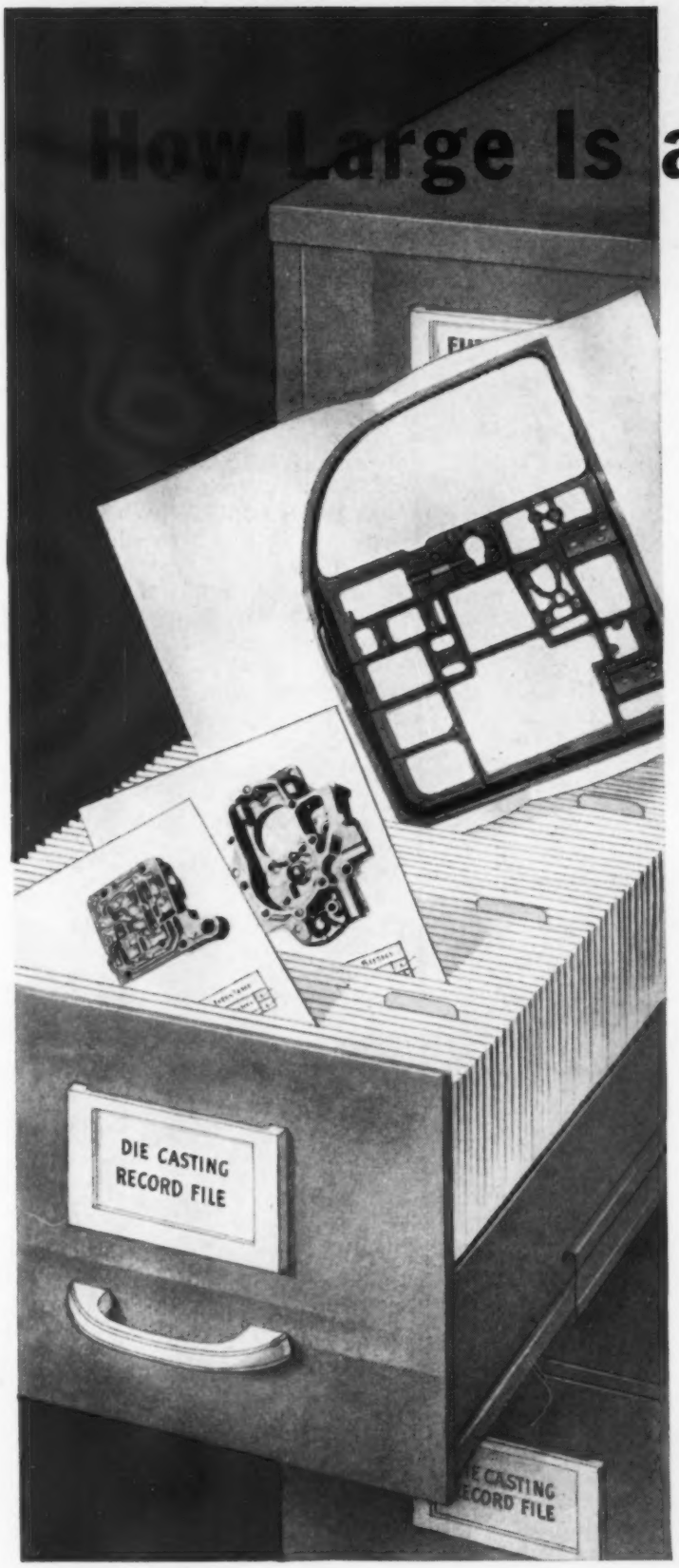
Emergency Lighting Unit

Lamplighter Corp. of America, 95 Atlantic Ave., Brooklyn 2, N. Y., has announced an automatic emergency double beam floodlight which lights instantly without touching a switch when regular power fails.

The unit, known as Model #B-900, is said to be approved by state fire marshals and to comply with the Connecticut state fire safety code. It uses standard dry-cell battery, either 6, 7½, or 9 volts. Different heads (lamps) are available for special conditions. Battery strength can be tested by flick of switch next to volt meter on case.

No. 120—For further information see Page 19

(*Please turn to page* 168)



How Large Is a Die Casting?

?

This question has been asked frequently since our last achievement of die-casting automobile door-panels. In size this die casting is forty-three inches high; thirty-three inches wide.

So far, it is the largest aluminum die casting produced.

There is no limit within reason

New vistas ahead are as limitless as the designer dares to imagine. Our engineering and research departments are anxious to cooperate to make your imagination a reality. A phone call to one of our plants, located nearest to you, will bring immediate response.

DOEHLER-JARVIS CORPORATION

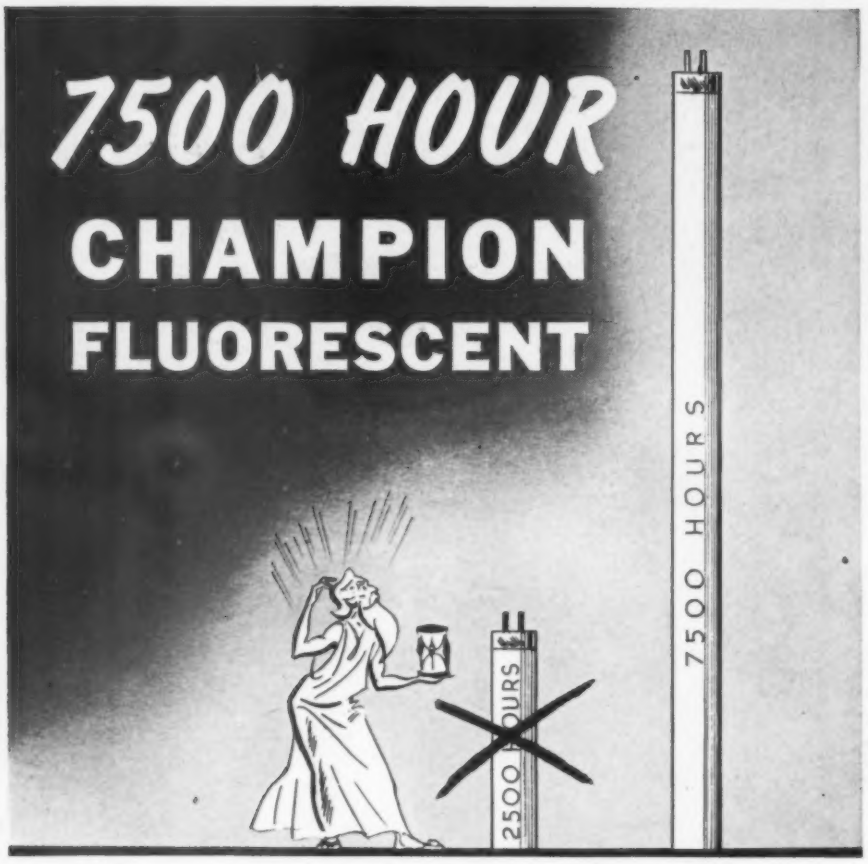
The World's Largest Producer and Finisher of Die Castings

PLANTS AT: TOLEDO, OHIO · POTTSTOWN, PA. · BATAVIA, N. Y. · GRAND RAPIDS, MICH. · CHICAGO, ILL.

EXECUTIVE OFFICES: 386 FOURTH AVENUE, NEW YORK 16, N. Y.

Want Additional Product Information? See Page 19.

7500 HOUR CHAMPION FLUORESCENT



From way back last May, CHAMPION Fluorescent Lamps in all regular pre-heat types have been sold with a *guaranteed* rated life of 7500 hours!*

WHAT DOES THIS MEAN TO YOU?

Without costing you a single extra penny, Champion Lamps have been giving you up to triple operating value. The cost of maintenance, because of fewer lamp replacements, is much lower.

Better look into this big bargain in better light — the Champion 7500 Hour Lamp. Get in touch with your local distributor or write us for full details on this amazing Lamp value.

*On 3 hour or longer burning cycles

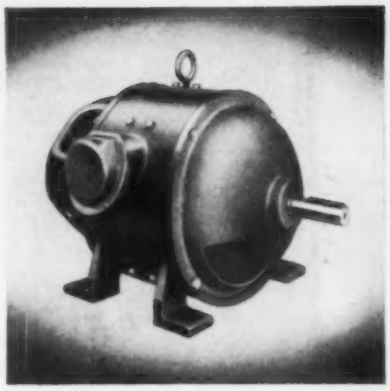
Here's How it adds up!

Three Times the **Life**
Three Times the **Value**
No Change in **Price**
Reduction in Maintenance

The Result — Most For Your Money When You Specify CHAMPION

CHAMPION LAMP WORKS
Lynn, Massachusetts
A DIVISION OF CONSOLIDATED ELECTRIC LAMP CO.

D-C Motors



New Type SK, direct-current Life-Line motors, in 1 to 30 hp ratings, are available from Westinghouse Electric Corporation, Pittsburgh 30, Pa.

The motors retain the basic design of earlier SK motors, but featurn the same all-steel construction used in the a-c Life-Line motors. Heavy steel end brackets provide maximum strength, rigidity, and correct bearing alignment, Westinghouse says. Pre-lubricated sealed-for-life bearings provide lubrication without attention. Motors are available for constant, adjustable, or varying speed applications—for either continuous or intermittent service. They are designed for operation from 115, 230, 550, or 660 volts.

No. 121 — For further information see Page 19

Flexible Stainless Hose

Flexible stainless steel hose, previously available only in conventional analyses, is now being produced in a highly corrosion-resistant alloy by Alloy Tube Division, The Carpenter Steel Company, 122 Springfield Road, Union, N. J.

The hose, made from Carpenter Stainless No. 20, comes in a size

(*Please turn to page* 170)

A complete line—
DISSTON BITE-RITE FILES
from a single good source—
YOUR LOCAL DISSTON
INDUSTRIAL DISTRIBUTOR

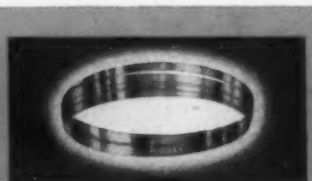
DISSTON®

...TOOL-MAKER'S TOOL MAKER

Thousands of dozens of files are used annually right in Disston plants, in the regular production of other fine Disston Tools. You could have no stronger proof that Disston Bite-Rite® Files are able to do the toughest kind of high-precision work, within rigid cost limits. *That's what Disston makes them for!*

Others in all lines of industry are likewise guarding quality, speeding schedules, and economizing, by using Disston Bite-Rite Files. *Disston Skill* makes each shape and cut precisely uniform. And *Disston Service* is ready to help you get every last penny's worth of good work out of Disston Files . . . and out of any other Disston Tools you buy.

For there is a qualified Disstoneer available to analyze operations for you, and consult with you on applying all Disston Tools most efficiently on any of your work. *Call for a Disstoneer to help you lick the jobs that lick the average tools!*



DISSTON METAL-CUTTING BAND SAWS
You can get the correct types from the Disston line—Hardened Throughout and Hard Edge Flexible Back (in Regular and Buttress Tooth patterns).

DISSTON HACK SAW BLADES
For a wide variety of machine and hand metal cutting operations.
IN THESE TYPES: High Speed Di-Mol Chromel® Duraflex® ®Reg.U.S.Pat.Off.

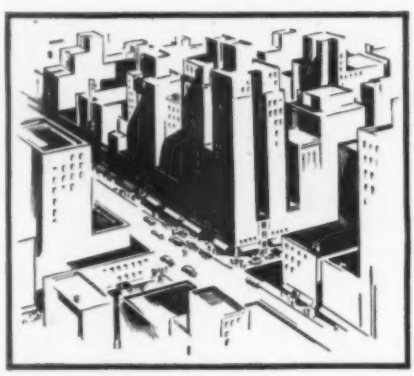
HENRY DISSTON & SONS, INC.
233 Tacony, Philadelphia 35, Pa., U. S. A.
In Canada, write: 2-20 Fraser Ave., Toronto 3, Ont.

BUSINESS IN MOTION

To our Colleagues in American Business . .

Because everybody spends a lot of time indoors, under a roof of one kind or another, the building industry has always been of prime interest to Revere. There are two reasons for this concern. One is the obvious consideration — a good, weather-tight, long-lasting building should contain adequate amounts of sheet copper in the appropriate places. The other is our feeling that, as a leading producer of sheet copper, we have an obligation to the public to see that there is an understanding of the economy and satisfaction obtained through the correct use of this metal for waterproofing.

Hence Revere some years ago embarked upon an extensive program aimed at developing the engineering principles, specifications and designs for successful application of sheet copper to all types of buildings. The information thus obtained has been freely published for all to follow, with assurance of lasting protection, whether for a home or a hospital, an office building, hotel or factory. Though anybody's copper can be used according to these specifications and designs, naturally Revere hopes it will be Revere copper, and indeed we are getting our share of the business. It is a great satisfaction to us not only to sell the copper, but to know that it is being applied in such a way as to give economical, enduring protection. This is especially important in these days of high labor costs, which make repairs due to the use of inferior materials or improper installation cost so much more than the price of good materials and workmanship, if used in the first place.



Now Revere has expanded its service to the building trades by offering solid copper flashing for masonry construction. The flashing is of chief interest to those designing and building large commercial structures, though of course it is also applicable to the private homes built of brick and stone. There is now available thru-wall flashing for economical and enduring protection against seepage and leaks at copings, parapets, belt courses, sills, spandrel beam facings and similar masonry applications. There is a reglet and reglet insert, also of solid copper, for waterproofing spandrels at costs comparable with or less than mopped-on waterproofing. There is vertical rib siding for use on high parapet walls, penthouses, and so on. All these items are pre-formed, and the simple directions for their use can be easily followed by any contractor, builder, or sheet metal worker. These new Revere Copper Products are available through sheet metal distributors throughout the country.

Though we have given these new items the widest possible publicity, we realize that in this vast country it is unlikely that absolutely everybody concerned will learn immediately about them and how much they can add to true economy. It takes time for news to get around. This time-lag is a problem for every company offering a new service or product. Recently we saw an advertisement of an important industrial material (felt) in which it was suggested: "Write us what you make, and benefit by our constructive ideas." That is good advice. Revere therefore recommends that no matter what you buy, whether metals or felt, chemicals or plastics, building materials or containers, you give your suppliers the opportunity to collaborate with you on the selection and application of new as well as old materials.

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

☆ ☆ ☆

Executive Offices:

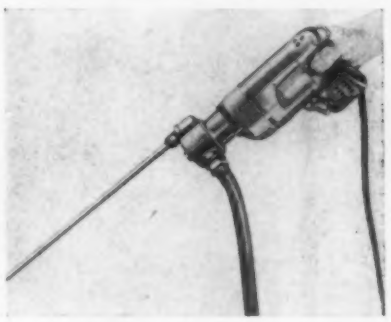
230 Park Avenue, New York 17, N. Y.

(*Continued from page* 168)

range from about 1" I.D. to 2⅝" I.D. in various angles. Carpenter says the hose will be particularly useful where full corrosion resistance must be combined with flexibility, on equipment which vibrates or must be moved from time to time. Other applications include fluid line connections and mechanical parts which must flex. Fittings such as standard pipe size nipples can be welded to the ends of the hose, or the hose ends can be provided in non-flexible standard tube sizes for use with flanges, etc.

No. 122—For further information see Page 19

Oil Changer

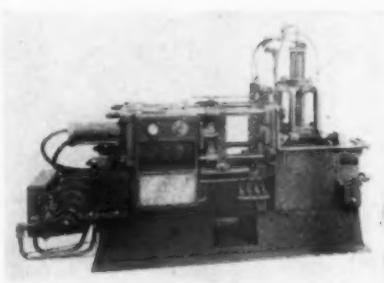


Oil changing in trucks, tractors and automobiles is said to be accomplished in two minutes or less with a new pump manufactured by Lostro, Inc., Newtown, O.

The pump, which weighs 5 lbs., is operated by inserting a tube in the measuring stick opening and pressing a trigger. The old oil is completely pumped into a bucket in 40 seconds, Lostro says, without messy splashing. The pump is self-priming, and housed in aluminum. The Black & Decker motor operates on 110 volts, a-c or d-c.

No. 123—For further information see Page 19

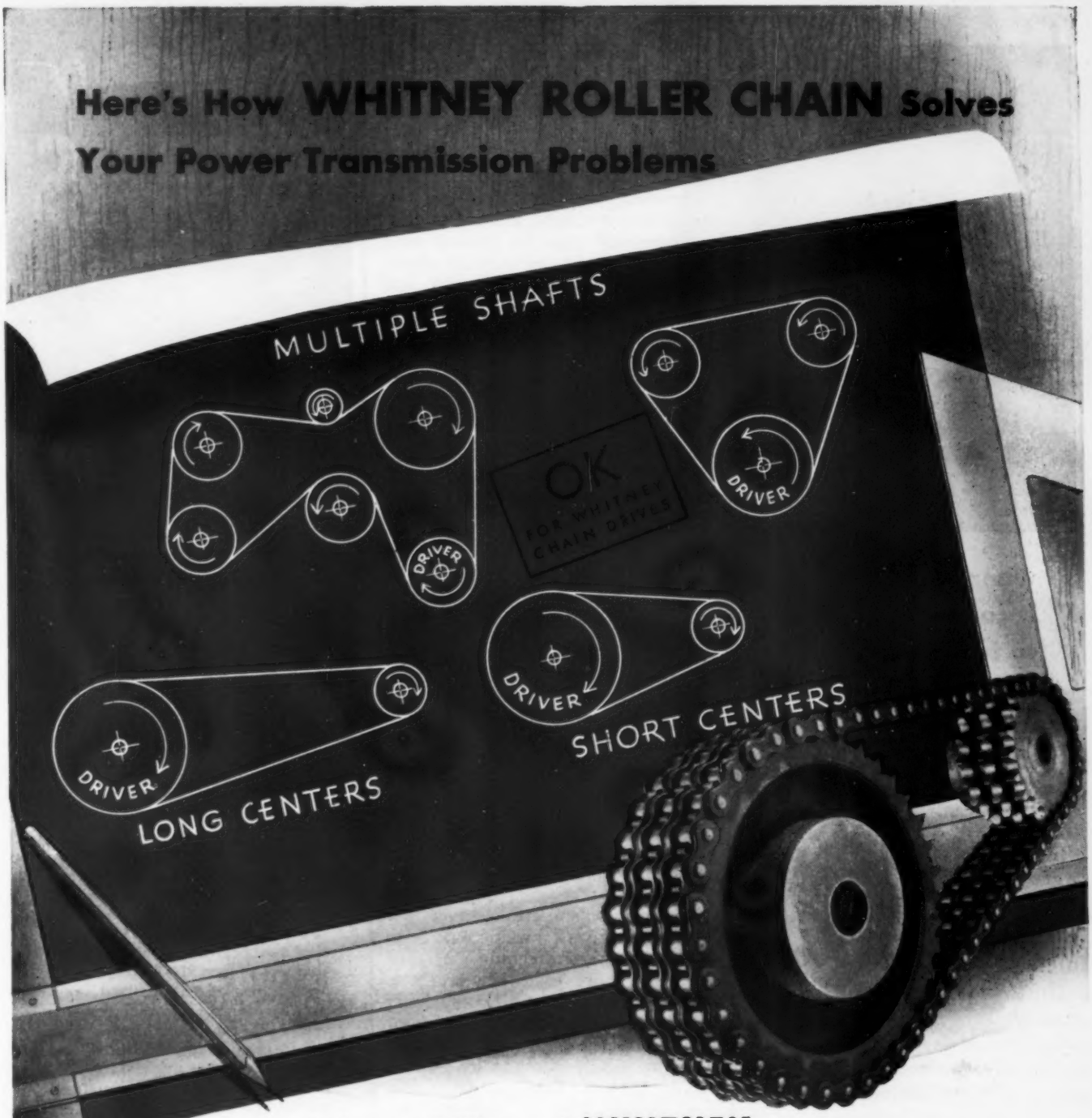
Die Casting Machine



The new Cleveland Model 50 meets the industry's needs for a small, rugged, low-cost die casting machine, according to the Cleveland Automatic Machine Company, 4932 Beech St., Cincinnati 12, O.

(*Please turn to page* 172)

Here's How WHITNEY ROLLER CHAIN Solves Your Power Transmission Problems



Adaptability of WHITNEY ROLLER CHAINS Simplifies Designs

Whitney Chain drives should be considered as flexible gearing, and, as such, they offer a wide range of drive selection and adaptability to all types of applications.

The versatility of Whitney Chain enables you to drive shafts clockwise or counterclockwise all from one power source. These alloy steel Whitney Chain drives deliver *full power* without slippage from power source to driven elements. They can be operated slack on short or long centers. They do not impose excess loads on shaft bearings. They absorb shock and overloads without breakage. They can be put on or taken off without disconnecting shafts or gears.

No matter what your power drive problems Whitney Chains and Cut Tooth Sprockets . . . *the all-steel drives* . . . will meet your requirements. Write for complete details, today.

CHAIN DRIVE IS BETTER

- Positive grip
- Transmits full horsepower
- Simplifies transmission designs
- Low maintenance
- Ease of installation
- Long operating life
- Constant uniform speeds
- High resistance to shock loads
- High load carrying capacity

WHITNEY CHAIN & MFG. CO.

DIVISION OF WHITNEY-HANSON INDUSTRIES, INC.

207 Hamilton Street, Hartford 2, Conn.

WHITNEY *Power Line* ROLLER CHAIN DRIVES

when it comes to fasteners— can you afford anything but the best?

A *good* fastener costs very little more to buy than an ordinary fastener.

But—anything but the best fastener can add costs in terms of assembly time and high reject ratio.

That's why it pays, for very little more, to buy *good* fasteners.

Scovill Makes *Good* Fasteners

A PRODUCT OF SCOVILL

Recessed Head Screws • Sems
Tapping Screws • Standard
Machine Screws • Special Cold Headed Parts

SCOVILL FASTENERS

Industrial Fastener Sales, Waterville Division
Scovill Manufacturing Co., Waterville 14, Conn.

New York • Detroit • Wheaton, Ill
Los Angeles • Cleveland • San Francisco

(*Continued from page* 170)

A high pressure hydraulic machine, it is equipped with a Vickers two stage pump driven by a 10 hp direct connected motor. The pump delivers 43 gpm at the low pressure stage and 10½ gpm at the high pressure stage. The machine can be furnished either as a cold chamber machine for casting aluminum or as a gooseneck type for casting zinc, tin, or lead. It can produce aluminum castings up to 2½ lbs. and zinc castings up to 4 lbs. The free cycle time of the machine is well over 1,000 shots per hour. Either automatic or manual controls can be supplied. Literature available.

No. 124—For further information see Page 19

Power Screw Driver

A new power screw driver for high-speed mass production lines features hopper feeding, driving speed of more than one screw a second in the smaller sizes, uniform tightening torque and a minimum of "down time" for conversion or adjustment. It is made by Shakeproof, Inc., a division of Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.

Practically all types and styles of screws in sizes ranging from No. 1 x ⅛" to ¼" x ¾" are readily accommodated by the specially designed hopper and driving spindle, according to Shakeproof. The unit is installed merely by plugging into a 110-volt outlet and connecting to the compressed air supply line. The new driver is fool-proof and greatly minimizes operator fatigue, Shakeproof says. A simple mechanism enables the operator to release a jam caused by a wrong sized screw, without delay or damage to the machine.

No. 125—For further information see Page 19

(*Please turn to page* 174)

Heavy-Duty GEARS

Cutting the teeth in a large diameter spur gear in the Simonds shop.

LARGE GEARS

OF ALL TYPES

up to 12 ft. dia.

When you need large or heavy-duty gears for new industrial equipment—for special machinery —for repairs or replacements—call on SIMONDS GEAR where they have been a specialty for more than 50 years. SIMONDS GEAR assures you of personalized attention to your specific requirements —faithful reproduction of your most exacting specifications—and faster service because SIMONDS' production is geared to specialized work. For all types of heavy-duty gears ranging to 145" dia. in materials including cast or forged steel, gray iron, bronze, silent steel, rawhide and bakelite—send your inquiry to SIMONDS GEAR.

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.

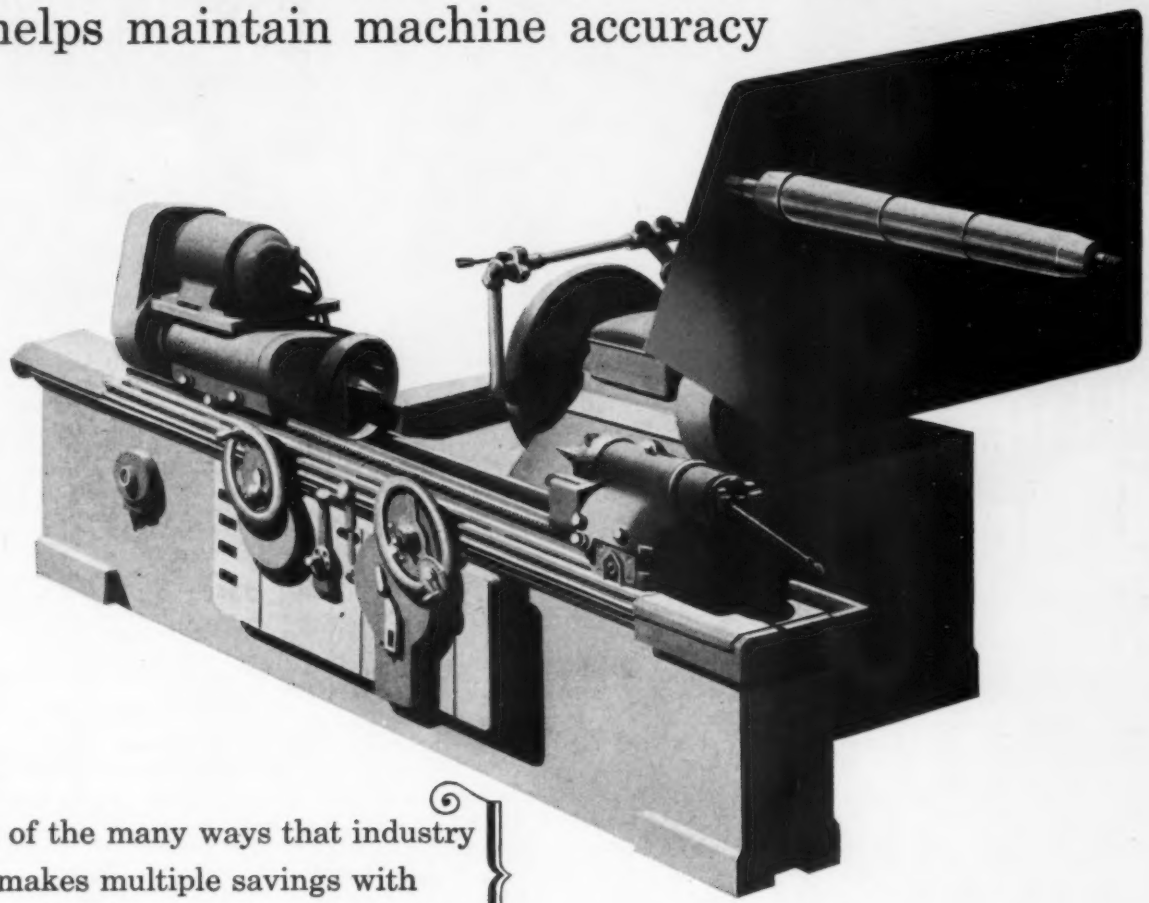
SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.

LIBERTY at 25TH PITTSBURGH 22, PA

GULFGEM OIL

provides better lubrication for spindles, helps maintain machine accuracy



One of the many ways that industry makes multiple savings with Gulf Quality Petroleum Products

Precision-built spindles in modern grinding machines operate at speeds of 10,000 r.p.m. and higher. In order that work accuracy can be maintained within a few ten-thousandths of an inch, spindle bearings must get full protection against excessive wear and sludge.

Recommended by Gulf Lubrication Engineers for this important protection job is Gulfgem Oil, the world's finest spindle lubricant. Super-refined by Gulf's exclusive Alchlor Process, Gulfgem Oil has unmatched resistance to oxidation and formation of sludge deposits—it lasts longer, and helps keep bearings clean. Outstanding lubricating qualities of Gulfgem Oil insure less wear, fewer bearing replacements, freedom from spindle vibration.

Gulfgem Oil is one of more than 400 Gulf quality oils and greases that are helping plant operating men make multiple savings through improved production and lower maintenance costs. For effective assistance on your lubrication and maintenance problems, write, wire, or phone your nearest Gulf Office today.

Gulf Oil Corporation • Gulf Refining Company

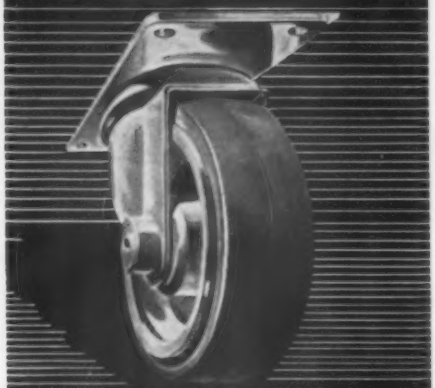
District Sales Offices:

Boston • New York • Philadelphia • Atlanta
New Orleans • Houston • Toledo

GULF MAKES AVAILABLE TOP QUALITY PASSENGER AND TRUCK TIRES . . . ASK YOUR GULF REPRESENTATIVE.

GULF INDUSTRIAL LUBRICATION

Helps make machines produce more at lower cost



Roll-Easy

Colson CASTERS

Save You Money

4 Ways

1 Save man-hours by moving materials faster, more easily.

2 Pay big dividends in reduced maintenance trouble and expense, because Colson casters are engineered and built by craftsmen—for years of trouble-free service.

3 Prevent breakage of fragile products by smooth handling over all floor surfaces.

4 Put an end to floor damage because the load-floating, roll-easy movement of Colson casters won't scratch or mar your floors.

Whether you're interested in one set of smooth quiet casters or a fleet of new trucks, Colson engineers can help you select or design equipment that will answer your materials-handling problem—exactly. Write us, or consult the yellow pages of your phone book (under "Casters" or "Trucks: Industrial") for the nearest Colson office.

THE COLSON CORPORATION
ELYRIA, OHIO

Please send free 68 page catalog —"Colson Casters"

Name_____

Position_____

Company_____

Street_____

City_____ Zone____ State_____

THE COLSON CORPORATION
ELYRIA, OHIO

6-lb. CO_2 Extinguisher

Randolph Laboratories, Inc., 8 East Kinzie St., Chicago, Ill., is producing a six-pound, portable, carbon-dioxide fire extinguisher, featuring thumb-trigger release and self-aimed nozzle.

Only one hand is required to operate the extinguisher, from the time it is removed from its bracket, until the flame is extinguished, Randolph says. With no valve or nozzles to adjust, it is said to be "panic proof". It contains six pounds of non-toxic, non-damaging carbon dioxide gas, and is especially adapted to smother flammable liquid and electrical fires. Randolph states that in Underwriters' Laboratories' official tests it extinguished a 16 sq. ft. gasoline fire in 7½ seconds.

No. 126 — For further information see Page 19.

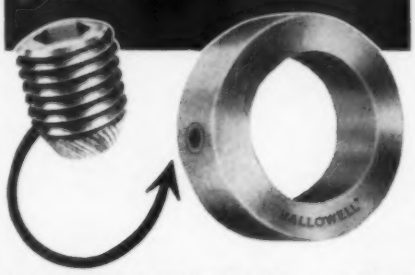
Contour Machine

Boice-Crane Co., 953 Central Ave., Toledo 6, O., says its all-purpose combination contour saw and band filer permits big time savings in cutting, filing and file broaching on small production parts, maintenance parts; irregular shaped stacked parts; spiral parts, tools,

(*Please turn to page* 178)

HALLOWELL

Steel Collars



HALLOWELL Solid Steel Collars, functionally proportioned throughout . . . precision-machined so faces run perfectly true . . . are beautifully polished all over . . . yet they cost less than common cast iron collars. 3" bore and smaller are made from Solid Bar Stock. To make sure the collar won't shift on the shaft, they are fitted with the famous UNBRAKO Knurled Point Self-Locking Socket Set Screw—the set screw that won't shake loose when once tightened. HALLOWELL . . . a "buy word" in shaft collars . . . available in a full range of sizes for IMMEDIATE DELIVERY.

Write for name and address of your nearest HALLOWELL and UNBRAKO Industrial Distributors.

OVER 47 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

JENKINTOWN 31, PENNSYLVANIA

Chicago • Detroit • St. Louis • San Francisco

Herbrand

PRECISION

DROP FORGINGS

. . . any size or shape up to 200 lbs.

Whatever your requirements in forgings, Herbrand is your most faithful source of supply . . . as it has been for hundreds of industries since 1881. Your inquiries are solicited.

Herbrand DIVISION
THE BINGHAM-HERBRAND CORP.
FREMONT, OHIO

WAREHOUSE STOCK

Why they think of WARD when it's SPRING STEEL

- **BLUE TEMPERED SPRING STEEL**
  Many Hundreds of Sizes
  .002" to .065" in thickness — .95 to 105 Carbon — 48-51 Rockwell

- **COLD ROLLED ANNEALED SPRING STEEL**
  .003" to .183" in thickness — .70 to .80 Carbon — .90 to 1.05 Carbon

CLOSE TO A THOUSAND SIZES IN STOCK — AND COMPLETE SLITTING AND SHEARING EQUIPMENT ENABLE US TO FILL PROMPTLY THE MAJORITY OF ORDERS RECEIVED.

WAREHOUSE SHIPMENTS ONLY ON THE ABOVE SPRING STEELS. NO EXPORT ORDERS.

Distributors

R. E. DEUTSCHE
765 Hampden Avenue
St. Paul 4, Minnesota
Telephone—NEStor 7279

EDGECOMB STEEL OF NEW ENGLAND, INC.
Milford, Connecticut
Telephone—MILford 4-1631

MILLER STEEL CO., INC.
40-50 Montgomery Ave.,
Hillside 5, N. J.
New Jersey, WAverly 3-8000
New York, BArclay 7-2056

WARD STEEL CO.
3042-3058 W. 51st St.
Chicago 32, Illinois
Grovehill 6-2600

LARGE STOCKS IN BOSTON

Cold Drawn Steel Bars, Rd., Sq., and Flats
Cold Rolled Low Carbon Strips
Flat Wire, Seamless Steel Tubing, Welded Tubing,
Electrical and Other sheet steels
Music Wire, Black & Annealed Cast Steel Wires
Polished Drill Rods

TELEPHONES
Boston 10, Mass., LIberty 2-2770
Providence, R. I., GASpee 8573
Chicago, Ill., Grovehill 6-2600

WARD STEEL CO.

33 FARNSWORTH ST. BOSTON 10, MASS.

HOW TO PREVENT *headaches* IN YOUR BRAIN CHILD

A new product involving the use of springs or formed wires can often cause a lot of headaches. But hundreds of manufacturers have saved themselves time, trouble and expense by taking our engineers into their confidence before the final design stage.

Our engineers analyze the proper relationship between the factors involved in a particular spring design . . . load, deflection, size, shape, finish, etc. Then after they have designed a spring that will stand up under the service requirements demanded, our mill men take over. These skilled toolmakers (many of whom have been with us for over 25 years) build into the spring the craftsmanship that, for over 125 years, has been a Wickwire tradition.

Small wonder then, that our list of repeat customers is constantly growing. They have seen their brain children develop into sturdy products that have bounced their way into profitable sales fields. Why not make an appointment to see us about *your* spring problem? There is no obligation and it may erase a lot of worries on your part.

Send for our free book, "Springs and Formed Wires." It's full of valuable data about spring selection and performance.

CF&I WICKWIRE SPENCER SPRINGS

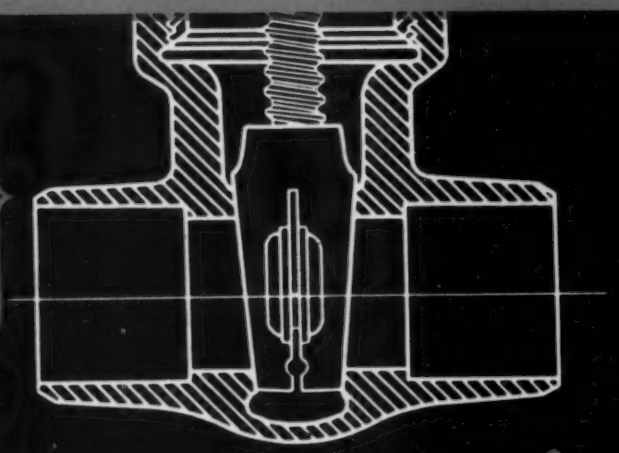
A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

SPRING SALES OFFICE & PLANT—2 New Bond St., Worcester 6, Mass. • EXECUTIVE OFFICE—500 Fifth Ave., N. Y. 18, N. Y.
SALES OFFICES—Boston • Buffalo • Chicago • Denver • Detroit • New York • Philadelphia
PACIFIC COAST—The California Wire Cloth Corp., Oakland 6, Cal.

Other Quality Wickwire Spencer Products include: Wire, Wire Rope, Metal Conveyor Belts, Chain Link Fence, Industrial Wire Cloth, Poultry Netting, Hardware Cloth, Insect Wire Screening, Welded Wire Fabric for concrete reinforcement.

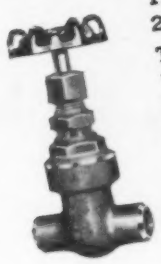
New...COPPER TO COPPER VALVES

WITH THINNER PIPE ENDS



for Easy Soldering

No. 28 GATE TYPE



125 lbs. W. S. P.
200 lbs. W. O. G.

This sturdy valve with non-rising stem features the hollow-cored, slotted Flexitite Disc* that assures all-around seal with seat. Also available with waste drain in ¾-in. size.

No. 29 GATE TYPE

125 lbs. W. S. P.
200 lbs. W. O. G.

This rising stem type valve is for all general service at standard pressure. Features hollow-cored, slotted Flexitite Disc* that assures all-around seal with seat.

NO. 24 GATE TYPE

100 lbs. W. S. P.
150 lbs. W. O. G.

Ideal for all full flow service for low pressure. Features the Flexitite Disc* that assures a valve that starts tight and stays tight.

CHECK THESE NEW O-B SOLDER TYPE VALVES

Quick, even distribution of heat through valve pipe ends is a must for leak-tight, copper-to-copper connections. By careful trimming of the valve wall, O-B has produced a fast-heating pipe end. Heat-wasting excess metal is eliminated without reducing the sturdiness of the valve itself.

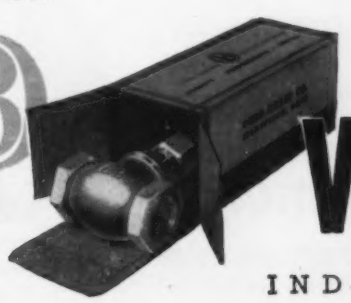
This thinner wall permits a rapid distribution ot heat through the pipe ends of the valve and assures an even flow of solder around the tubing. Carefully tapered, the pipe end walls take advantage of the inserted tubing for reinforcement resulting in a sturdy, leak-tight connection.

AVAILABLE IN THE FOLLOWING SIZES

No. 28	⅜	½	¾	1	1¼	1½	2
No. 29	⅜	½	¾	1	1¼	1½	2
No. 24	⅜	½	¾	1	1¼	1½	2
No. 6	⅜	½	¾	1	All sizes indicated in inches.		
No. 7	⅜	½	¾	1			

4015-V

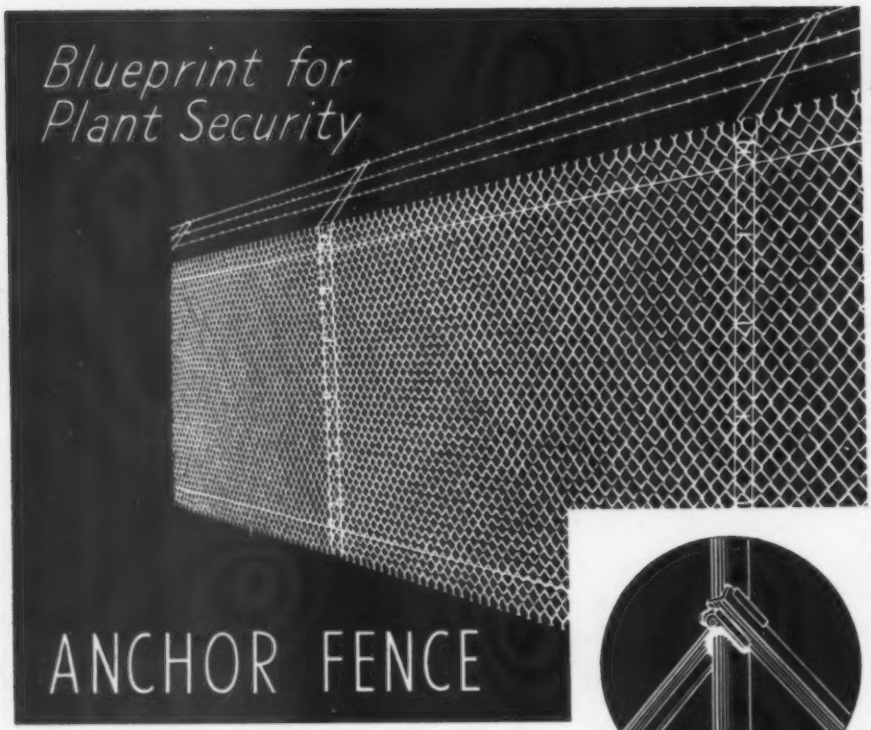
* Reg. U. S. Pat. Office



Ohio Brass VALVES

FOR DOMESTIC AND INDUSTRIAL USE

Want Additional Product Information? See Page 19.

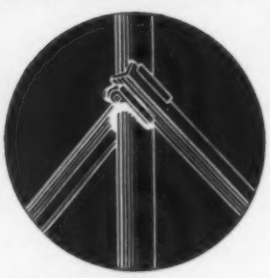


WHEN you've got a rugged, long-lived Anchor Chain Link Fence guarding your plant, you're sure of the most *complete* protection! Anchor Fence keeps out trespassers, snoopers, agitators, all kinds of trouble-makers . . . stands guard night and day over valuable equipment and materials either in your plant or stored in the yard.

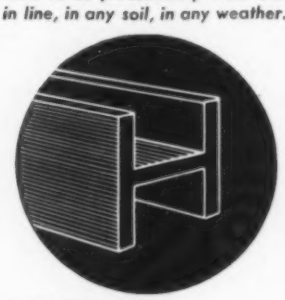
What's more, Anchor Chain Link Fence and Gates will help direct your plant's flow of foot and motor traffic more systematically. We'll install it where it will do the most good in giving you efficient control over production, shipping and receiving operations.

Just check the *exclusive* features that give you *longer lasting* service and protection with Anchor Fence. You can have these same advantages for your plant. Look in your 'phone book now, and call a trained Anchor Fence engineer. Or write for our big, illustrated Industrial Fence Catalog, to: ANCHOR POST FENCE DIVISION, Anchor Post Products, Inc., 6615 Eastern Ave., Baltimore 24, Maryland.

Anchor Fence
Nation-wide Sales and Erecting Service



DEEP-DRIVEN ANCHORS
Hold fence permanently erect and in line, in any soil, in any weather.



H-BEAM LINE POSTS
Carbon steel, rigid and rust-free because their open construction is self-draining.

SQUARE FRAME GATES
Stronger, amazingly free from sagging and warping.

SQUARE TERMINAL POSTS
Provide increased strength, add durability and improve appearance.

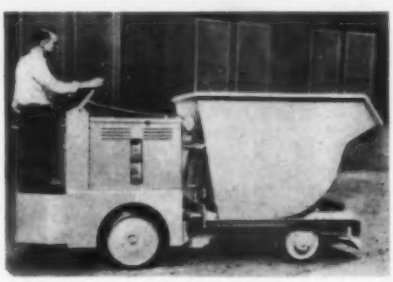
(*Continued from page* 174)

templates and stamping, forming and trimming dies.

The company calls it the first combination contour saw and band filer made with speeds of up to 4,100 blade fpm for cutting wood and other industrial materials, and speeds ranging down to 92 blade fpm for cutting tool, bar and sheet steel, brass, aluminum, cast iron and bronze, transite, and for filing a variety of metals. Rigidity of the hardened steel file guide and backer-up is said to assure rapid filing and absolutely flat work.

No. 127—For further information see Page 19

Dump Truck

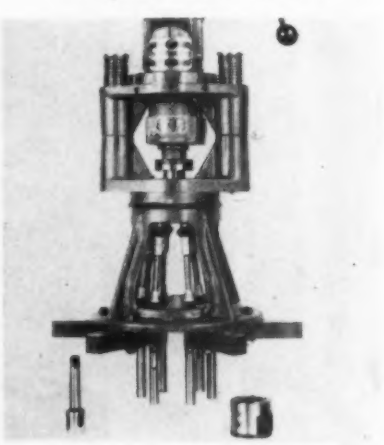


Mercury Manufacturing Co., 4016 S. Halsted St., Chicago 9, Ill., is now in production on its Model A-1015-9 battery powered electric end dump burden carrier truck.

Released by a lever near the operator, the body dumps cleanly by gravity and returns to lever latched position when emptied. Body capacity is 1½ cu. yds. and the truck load capacity is rated at 6,000 lbs. The chassis has four-wheel lever type steering, double reduction drive axle, semi-elliptic spring suspension, and mechanical contactor travel controller.

No. 128—For further information see Page 19

Tap-or-Drill Unit



A multiple spindle drilling and tapping unit that attaches to any

(*Please turn to page* 180)

READY NOW

"PLUG-IN" STRIP WITH GROUNDING FACILITIES

TYPE CF2-G

"Plug-In" Strip provides convenience in location through a s-p-r-e-a-d of outlets. Outlets every 6" or 18".

A dual-purpose, metal-clad, multi-outlet assembly—two electrical wiring systems in one.

Dual Service Receptacle (Insulator barriers removed for illustration)

Type CF2-G Grounding "Plug-In" Strip permits use of grounded or ungrounded devices *from the same outlet* . . . Will take either the new *Series 5200* 3-blade grounding plug or the standard 2-blade ungrounded plug.

STEEL FOR PERMANENCE

GROUNDED FOR SAFETY

Listed by Underwriters' Laboratories, Inc.

UNLIMITED APPLICATIONS . . . in FACTORIES . . . OFFICES . . . STORES . . . HOMES . . . HOTELS . . . APARTMENTS . . . SCHOOLS . . . HOSPITALS . . . INSTITUTIONS . . . "Plug-In" Strip is a professional material. Consult your electrical contractor for installation. *Grounding* "Plug-In" Strip meets contemplated revisions in the National Electrical Code covering grounded electrical systems. Type CF2-G Grounding "Plug-In" Strip is the quickest and easiest method of meeting grounding requirements. Write for our *free* folder "Grounding Plug-In Strip."

Everything in wiring points to NE

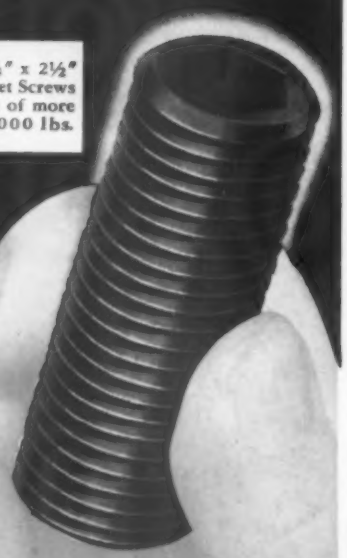
National Electric

PRODUCTS CORPORATION

1351 CHAMBER OF COMMERCE BUILDING, PITTSBURGH 19, PENNSYLVANIA

IT'S A
Mac-it
PRONOUNCED "MACK-IT"

Mac-it ⅛" x 2½" Hollow Set Screws have grip of more than 17,000 lbs.



Better, Faster Service with this *Complete* Mac-it Line!

Because many standard types of Mac-its are available throughout the country for quick delivery, and because specials can be engineered to your own specifications, you'll find it pays to investigate Mac-its *first.*

Mac-it's 35 years' experience in the manufacture of heat-treated, alloy steel screws is your assurance of precision, uniformity and strength. Sold through leading industrial distributors from coast to coast and in Canada. Write for new Mac-it catalog today!

Other Mac-it products include:

- Socket Head Cap Screws
- Hollow Pipe Plugs
- Stripper Bolts
- Hollow Lock Screws
- Socket Screw Keys
- Square Head Set Screws
- Hexagon Head Cap Screws

. . . and many others

Marketed Nationally Since 1913 by
STRONG, CARLISLE & HAMMOND COMPANY
Cleveland 13, Ohio

(*Continued from page* 178)

drill press and will drill or tap an infinite number of patterns has been announced by Thriftmaster Products Corp., division of Thomson Industries, Inc., 10 North Plum St., Lancaster, Pa.

Sturdy rods maintain rigid alignment and springs counterbalance weight of mutiple head, assuring sensitivity in tapping. Standard models are available with two to ten spindles, adjustable from ½" minimum centers within a 10⅜" diameter circle. The unit will take drills or taps up to ⅜" diameter in cast iron depending on centers. Universal adjustable drillhead may be replaced with any type adjustable or fixed center head of different capacity. Unit may also be disassembled and tapper or drillhead used independently.

No. 129—For further information see Page 19

Sealed Steel Container

Sealed, air-tight steel containers for maximum shipping protection for all kinds of products, from delicate instruments to heavy duty parts, are available from Steel Drum Packaging and Acc. Inc., 9505 Sandusky Ave., Cleveland 5, O.

Used during and since the war by the armed services, the drums are said to protect products from corrosion as much as ten years after packing, when a small supply of silica gel is placed inside prior to sealing. The part to be shipped is bolted down to the mounting block using its regular base plate or mounting holes. SPDA says standard inner packs of various designs have been developed, and special designs will be engineered where necessary. The containers come in 4 to 55 gal. capacity.

No. 130 — For further information see Page 19

1
SOURCE FOR ALL PARTS YOU NEED

LOCK WASHERS

High carbon steel, bronze, aluminum, stainless steel, monel metal, spring lock washers . . . finished or plated with cadmium, nickel, brass or copper. Also Garrett's Aluminum Spring Lock Washer—light in weight with strength of steel.

FLAT WASHERS

Made to meet ASA and SAE specifications in regular steel spring steel, stainless steel, brass, bronze, monel metal, aluminum, Alclad and copper. Can be plated with zinc, cadmium, nickel, brass, chrome . . . or can be parkerized.

STAMPINGS

From a small part for electronic instruments, automotive stampings and television chassis... Garrett can fabricate them better and cheaper than is possible in your own plant. Years of experience and modern high speed equipment assure speed deliveries . . . finished to your specifications.

SPRINGS

Flat and coiled springs to meet every requirement. Every Garrett spring has controlled tension built into it to assure satisfactory performance under all conditions. All types of flat springs . . . coil springs — compression, extension . . . made of round, square or rectangular wire.

MANUFACTURED BY
GEORGE K. GARRETT CO., INC.
PHILADELPHIA 34, PA.

GARRETT
MANUFACTURERS OF SMALL PARTS

full line from a single source

BEMIS Cotton Bags . . .

Bemis makes every type of cotton bag . . . from tiny sample bags to huge cotton pick sacks. In between, in numerous specifications to meet varied requirements, are dozens of types made of osnaburg, bleached and unbleached sheetings, dress prints, woven stripes and other constructions . . . and many cotton specialty products, including open-mesh.

Bemis also makes waterproof laminated textile bags, multiwall paper shipping sacks, cellophane bags, paper specialties, Tite-fit Tubing and other packaging materials.

All Bemis products are top quality and top value. You'll profit by using them. If you use more than one type, you'll profit doubly by being able to fill all of your requirements from a single source. Write us for detailed information and for the helpful booklet, "Pocket Guide to Bemis Products."

COTTON · BURLAP · PAPER BAGS · ESTABLISHED 1858 · BEMIS BRO BAG COMPANY

Bemis

Baltimore • Boise • Boston • Brooklyn • Buffalo • Charlotte • Chicago • Cleveland
Denver • Detroit • Houston • Indianapolis • Jacksonville, Fla. • Kansas City
Los Angeles • Louisville • Memphis • Minneapolis • New Orleans • Norfolk
New York City • Oklahoma City • Omaha • Phoenix • Pittsburgh • St. Louis
Salt Lake City • Salina • San Francisco • Seattle • Wichita

Want Additional Product Information? See Page 19.

all new all the way thru

Buy One

MOTOR STARTERS with the 'Strongbox' Magnet Coil

All the best features in popular sizes for motors to 50 hp. See for yourself. Get a new General Electric Motor Starter. Get out your screwdriver. And get the facts. Make your own comparison on these big ALL-NEW features:

STRONGBOX MAGNET COIL – Coil is locked in a tough block of plastic.

NEW ARC HOOD – Molded, burn-resistant arc hood snuffs arc immediately.

NEW CONTACTS – Large silver contacts with plenty of contact pressure give long life. Convertible from normally open to normally closed in size one and smaller – without additional parts.

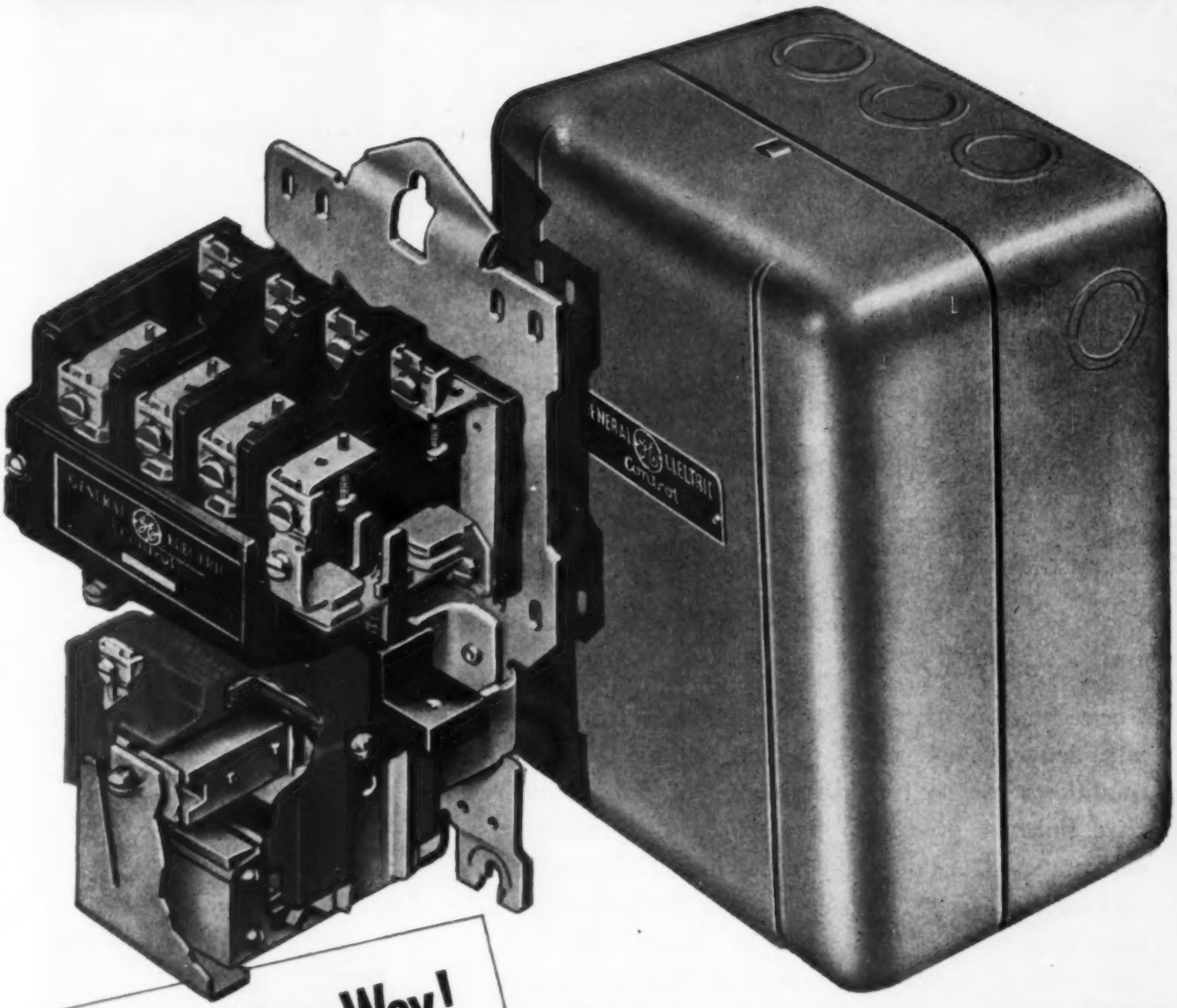
NEW MAGNET – Quick direct action, large striking surface.

EASY TO INSTALL – EASY TO MAINTAIN – See how easy it is to get at the ALL-NEW General Electric starter. Note, too, that it's built to take the punishment of day-in, day-out use with a minimum of maintenance. Check the wiring space inside the case. Check the terminal clamps that make installation fast. Check the ease with which controls can be inspected.

DESIGNED FOR FAST ACTION – BUILT FOR LONG LIFE – From the tough STRONGBOX magnet coil to the high strength arc hood, all parts of the new General Electric Motor Starter are built to last. In the revolutionary G-E design, the plastic coil enclosure also serves to guide the armature. For fast, positive action the tough plastic block is impregnated with a permanent lubricant – molybdenum sulphide. Channel-reinforced magnet guides slide smoothly for quick action at all times. Bimetallic thermal relays give swift protection.

GENERAL ELECTRIC

and COMPARE



Order this Easy Way!

Look inside. Make the screwdriver comparison test. Inspect the many new features, and we're sure you'll be enthusiastic. Just fill in the coupon at the right and we'll send you the starter immediately. Or, if you prefer, we'll be glad to send you the new, free, tell-all booklet "Look Inside and Compare" that gives more detailed information.

General Electric Company, Apparatus Department
Section N676-281, Schenectady 5, N. Y.

Send me one of the NEW CR7006 starters (size 1, 3 pole, enclosed). List Price $22.00.

_____ Check Enclosed. (Add any state or local sales or use taxes)

_____ Purchase order attached; bill to our account with: _____

_____

_____

(Name and address G-E sales office or G-E distributor.)

Motor Horsepower Rating (check one)

☐ 3 ☐ 5 Horsepower at 220 Volts
☐ 3 ☐ 5 ☐ 7½ Horsepower at 440 Volts } 60 Cycles, 3 Phase

Approx. Motor Speed ☐1800 RPM ☐ 3600 RPM ☐ 1200 RPM

Name_____

Address_____

City_____ **Zone**_____ **State**_____

Contractor saves penalty of $500 — by investing $3.84 in Air Express

Time clause in housing project paving contract stood good chance of being invoked when equipment broke down at 5 P.M. So 10-lb. carton of replacement parts was Air Expressed from 1200 miles away. Delivered in just 8 hours. The Air Express charge was only $3.84—and contractor completed job on time.

$3.84 is small indeed, since it covers door-to-door service. Anytime delivery, 7 days a week. Makes the *world's fastest* shipping service the most convenient.

Air Express goes by Scheduled Airlines; extra dependability, *experienced* handling. Shipments keep moving. Regular use keeps *any* business moving.

Only Air Express gives you all these advantages

World's fastest shipping service.
Special door-to-door service at no extra cost.
One-carrier responsibility all the way.
1150 cities served direct by air; air-rail to 22,000 off-airline offices.
Experienced Air Express has handled over 25 million shipments.

Because of these advantages, regular use of Air Express pays. It's your best air shipping buy. For fastest shipping action, phone Air Express Division, Railway Express Agency. (Many low commodity rates in effect. Investigate.)

AIR EXPRESS
GETS THERE FIRST

Rates include pick-up and delivery door to door in all principal towns and cities

A service of
Railway Express Agency and the
SCHEDULED AIRLINES of the U.S.

(*Continued from page* 184)

expansion which takes place as rolling progresses. Vacuum cup and roller handling equipment do away with laborious manual handling usually associated with brass mill work, and are big factors in eliminating dents, pits, gouges and scratches in the metal.

Through its integration of continuous casting with the most modern cold-rolling equipment and production techniques, Scovill claims to have achieved important refinements in strip and sheet brass, including:

Ability to produce the heaviest continuous cast coils in the brass industry, with no weld to pull apart and no imperfect joints to damage dies or tools:

Uniformity of chemical composition, temper and gauge from strip to strip and sheet to sheet;

Annealed and cold-rolled tempers and grain size more closely controlled than ever before;

Reduction in camber (edge-wise curvature) of strip and sheet, and practical elimination of variation in gage across width of the strip or sheet.

HEAVY DUTY SEALING TAPE

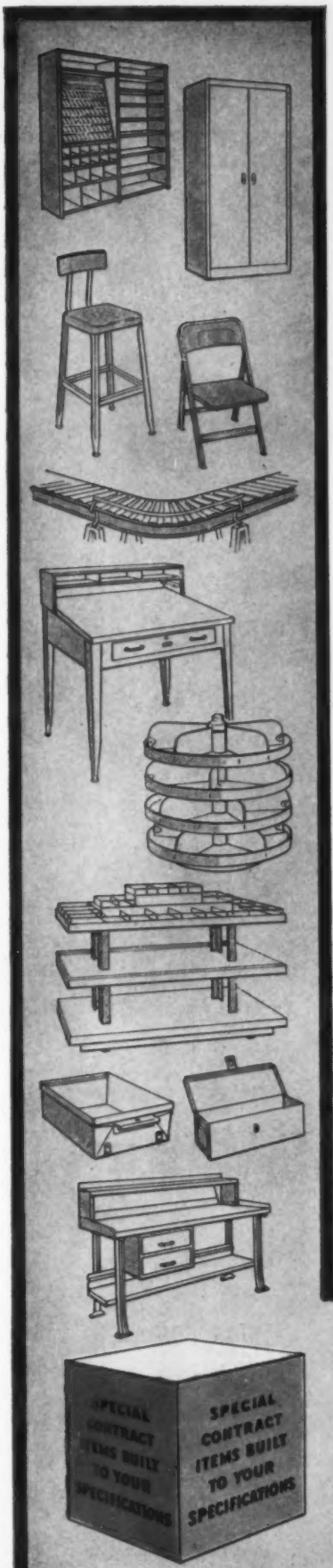
Heavy duty sealing tape for corrugated cartons named Glaskraft has been put on the market by McLaurin-Jones Co., Brookfield, Mass. It consists of two sheets of kraft laminated with asphalt in which are imbedded glass fibres for added strength. Its tear test is said to be about six times that of ordinary sealing tape. The new tape is smooth on both sides, thus assuring a good bond, neat appearance, and a good printing surface. The fibres of the tape are laid in such pattern as to give a strong tear in all directions.

NEW GE FLUORESCENT LAMPS BRING OUT FULL BEAUTY OF COLORS

New fluorescent lamps which bring out the "full beauty" of all colors, are announced by the General Electric Company's lamp department. Named "de luxe cool white" and "de luxe warm white", the former are recommended where color needs are critical and best overall color rendition is important, and the latter combines color impression with good, but not highest, light efficiency, giving vastly improved color rendition.

Two additional types are the standard cool white, and the standard warm white. The former is the "whitest" fluorescent, gives equal emphasis to all colors, and is used in offices, factories, stores and schools, or wherever high light-efficiency with cool atmosphere is important. Standard warm white combines the color impression of filament light, emphasizes warm colors, and is particularly desirable for minimizing color contrast between light sources in combined fluorescent-filament lighting systems.

(*Please turn to page* 190)

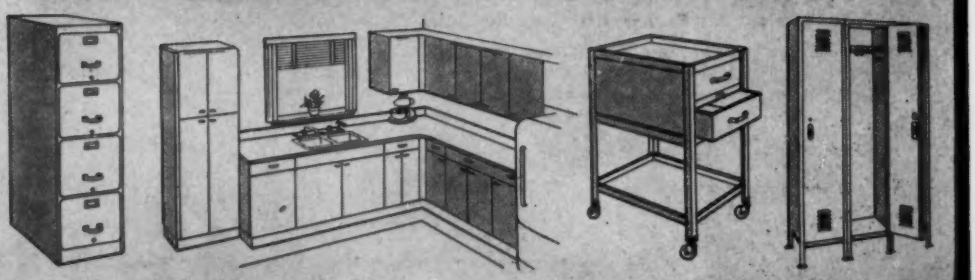


LYON

MAKES
more than
1500
regular cataloged
items of steel
equipment .

. . . WILL
special
items to
specifications

LYON METAL PRODUCTS, INCORPORATED
General Offices: 233 Monroe Avenue, Aurora, Illinois
Factories: YORK, PA., AURORA, ILL., CHICAGO HEIGHTS, ILL.
Warehouses, Branches and Dealers in Principal Cities



A PARTIAL LIST OF LYON PRODUCTS

• Shelving	• Kitchen Cabinets	• Filing Cabinets	• Storage Cabinets	• Conveyors	• Tool Stands	• Flat Drawer Files	
• Lockers	• Display Equipment	• Cabinet Benches	• Bench Drawers	• Shop Boxes	• Service Carts	• Tool Trays	• Tool Boxes
• Wood Working Benches	• Hanging Cabinets	• Folding Chairs	• Work Benches	• Bar Racks	• Hopper Bins	• Desks	• Sorting Files
• Economy Locker Racks	• Welding Benches	• Drawing Tables	• Drawer Units	• Bin Units	• Parts Cases	• Stools	• Revolving Bins

let's get down to earth!

about stainless steel

Many users of stainless steel speak so glowingly of it that it would seem there is nothing stainless *can't* do. Stainless steel is more than *one* kind of specialty steel . . . it is a complete series of steels for many uses.

Unless the *right* stainless analysis is selected, it won't do a good job. You would expect this down-to-earth approach from Crucible. That's the measure of Crucible's half century of specialty steel leadership.

Crucible designed, built and put into operation one of the first integrated mills in this country designed specifically to hot and cold roll stainless steel. This $18,000,000 mill is an important step in Crucible's aim to supply Industry with every form of specialty steel.

Because of its excellent resistance to corrosion and wear, Crucible Stainless Steels are finding increasing application in the metal-finishing and metal-products industries.

Crucible, a pioneer in the development of stainless steels, offers you the services of an unsurpassed staff of metallurgists to help you work out your stainless application problem. These engineers and metallurgists are freely available to you. One word from you puts a background of 50 years of specialty steel leadership at your service.

CRUCIBLE STEEL COMPANY OF AMERICA,
Chrysler Building, New York 17, N. Y.

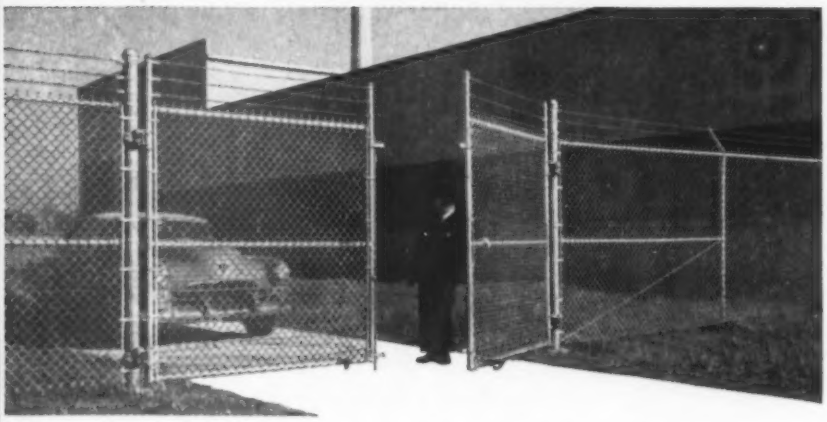
CRUCIBLE first name in special purpose steels

hot and cold rolled **STAINLESS SHEET AND STRIP**

STAINLESS • HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE • STEELS

PAGE FENCE - Since 1883

• AMERICA'S FIRST WIRE FENCE •



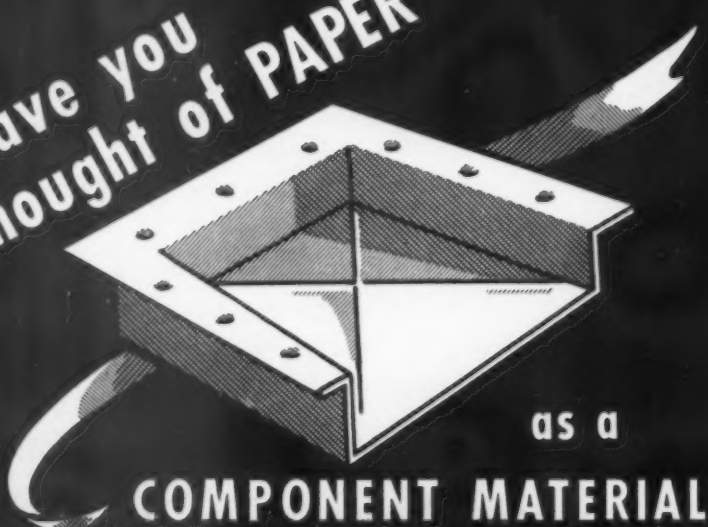
Tailored to Your Needs

● Whether you have management or operating responsibility we have a new, informative booklet that's tailored for you. It will give you valuable information on day and night protection of property and persons by means of fence that's also tailored to your requirements. Your Page Chain Link Fence can be of the style, height and metal that is best for you, no matter what the conditions. And it will be erected by experienced, local experts who offer more than a product—a complete fence service. Write for DH-142. With it we will send name and address of nearest Page Fence specialist.

Write to PAGE FENCE ASSOCIATION in Monessen, Pa., Atlanta, Bridgeport, Chicago, Denver, Detroit, Los Angeles, Philadelphia, Pittsburgh, New York or San Francisco.

PRODUCT OF PAGE STEEL & WIRE DIVISION OF AMERICAN CHAIN & CABLE COMPANY, INC.

Have you thought of PAPER as a COMPONENT MATERIAL?



Today special papers manufactured by Central are replacing metal, cloth and many other materials . . . improving product design . . . lowering costs . . . increasing production.

There may be a place in your product where an engineered paper by Central can improve its quality or lower its cost. Consult Central Paper Engineers about your problems . . . their expert advice is yours for the asking.

REG. U.S. PAT. OFF.

CENTRAL PAPER COMPANY INC.

2446 Lakeshore Drive • Muskegon, Michigan

BRANCHES IN LEADING CITIES

HANDY SAMPLE FILE OF CORRUGATED MATERIALS

A reference file of actual samples of corrugated materials, covering a broad range of types and grades, in a kit small enough to keep on the corner of a desk or on a bookshelf, is being made available to purchasing agents and others responsible for selection of corrugated packaging and shipping materials, by the Chippewa Paper Products Co., Inc., 3315 W. 48th Place, Chicago 32, Ill.

The kit, which is styled the Chippakit, holds more than 20 labeled samples of Chippaflex flexible corrugated, and Chippewa and Chief single-faced corrugated, in the various weights, facings, flutes, etc. Full identification makes it easy to select the proper materials for developing new or improving old packages or shipping methods.

FOOT PEDAL FLUSH

Easy Flush Pedal, which converts a hand operated flushing action on toilets to a foot pedal flush, has been put on the market by Approved Products Co., 205 E. 42nd St., New York, N. Y. The pedal is designed to accommodate all flushometer and tank type water closets on both new and existing installations. No plumbing changes or shutting off of water supply are required. The device is of sturdy construction and design in polished chromium plating on heavy gauge brass. Installation time is about ten minutes.

EVAPORATIVE CONDENSER SAVES AIR CONDITIONING WATER

Water saving up to 95 per cent is possible in many types of air conditioning systems, according to L. P. Hanson, vice president in charge of sales of United States Air Conditioning Corporation, Minneapolis, Minn.

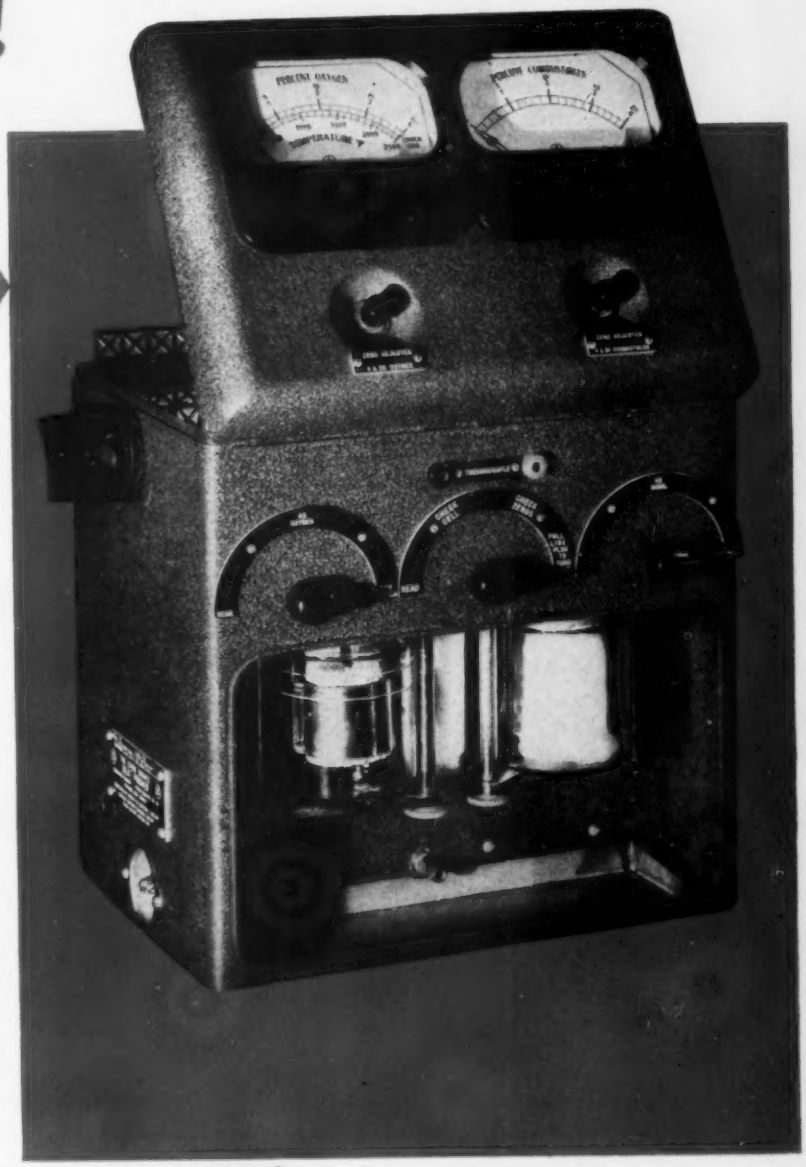
"Air conditioning systems that ordinarily require large quantities of water should be complemented with an evaporative condenser or other conservation device which will reduce water consumption to as little as 5 per cent of normal," Mr. Hanson explained.

"This saving is vital now, when many sections of the nation are facing acute

(*Please turn to page* 192)

Put this Remarkable Instrument to work!

It's the most talked-about new service in industrial lubrication



"In less than two hours after installation, this instrument showed us how to increase our production by 18%."
—Plant Superintendent

Hundreds of industrial firms including leading steel, locomotive, truck, automobile, aircraft, tool instrument manufacturers and others are profiting by this unique industrial service. There is no charge or obligation. Contact the office nearest you or write for free booklet at right.

A complete line of quality lubricants for industry:

- **Heavy Duty Motor Oils**
- **Chillo Cutting Oils**
- **Trojan Greases**
- **Cisco Compounds**
- **D-C Diesel Engine Oils**
- **Plant Machinery Oils**
- **Plus two hundred other petroleum products**

FREE!
This helpful booklet!

The Industrial Heat Prover is a *flue gas* analyzer. It tells quickly, accurately and continuously how much fuel is wasted by needlessly heating excess air . . . and how to correct this loss. Send coupon today for more information.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

CITIES SERVICE OIL COMPANY
Sixty Wall Tower, Room 552
New York 5, N. Y.

Please send me without obligation your new booklet entitled "Combustion Control for Industry."

*Name*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

when it comes to fasteners— can you afford anything but the best?

A *good* fastener costs very little more to buy than an ordinary fastener.

But—anything but the best fastener can add costs in terms of assembly time and high reject ratio.

That's why it pays, for very little more, to buy *good* fasteners.

Scovill Makes Good Fasteners

A PRODUCT OF SCOVILL

Recessed Head Screws • Sems
Tapping Screws • Standard
Machine Screws • Special Cold Headed Parts

SCOVILL FASTENERS

Industrial Fastener Sales, Waterville Division
Scovill Manufacturing Co., Waterville 14, Conn.

New York • Detroit • Wheaton, Ill
Los Angeles • Cleveland • San Francisco

(*Continued from page* 170)

A high pressure hydraulic machine, it is equipped with a Vickers two stage pump driven by a 10 hp direct connected motor. The pump delivers 43 gpm at the low pressure stage and 10½ gpm at the high pressure stage. The machine can be furnished either as a cold chamber machine for casting aluminum or as a gooseneck type for casting zinc, tin, or lead. It can produce aluminum castings up to 2½ lbs. and zinc castings up to 4 lbs. The free cycle time of the machine is well over 1,000 shots per hour. Either automatic or manual controls can be supplied. Literature available.

No. 124—For further information see Page 19

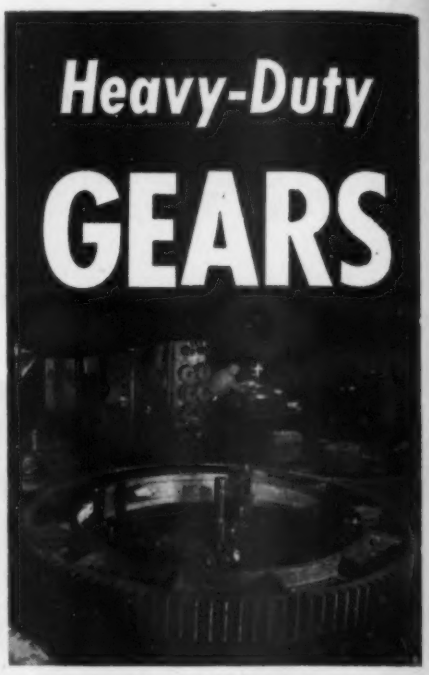
Power Screw Driver

A new power screw driver for high-speed mass production lines features hopper feeding, driving speed of more than one screw a second in the smaller sizes, uniform tightening torque and a minimum of "down time" for conversion or adjustment. It is made by Shakeproof, Inc., a division of Illinois Tool Works, 2501 N. Keeler Ave., Chicago 39, Ill.

Practically all types and styles of screws in sizes ranging from No. 1 x ⅛" to ¼" x ¾" are readily accommodated by the specially designed hopper and driving spindle, according to Shakeproof. The unit is installed merely by plugging into a 110-volt outlet and connecting to the compressed air supply line. The new driver is fool-proof and greatly minimizes operator fatigue, Shakeproof says. A simple mechanism enables the operator to release a jam caused by a wrong sized screw, without delay or damage to the machine.

No. 125—For further information see Page 19

(*Please turn to page* 174)



Cutting the teeth in a large diameter spur gear in the Simonds shop.

LARGE GEARS

OF ALL TYPES

up to 12 ft. dia.

When you need large or heavy-duty gears for new industrial equipment—for special machinery—for repairs or replacements—call on SIMONDS GEAR where they have been a specialty for more than 50 years. SIMONDS GEAR assures you of personalized attention to your specific requirements—faithful reproduction of your most exacting specifications—and faster service because SIMONDS' production is geared to specialized work. For all types of heavy-duty gears ranging to 145" dia. in materials including cast or forged steel, gray iron, bronze, silent steel, rawhide and bakelite—send your inquiry to SIMONDS GEAR.

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.

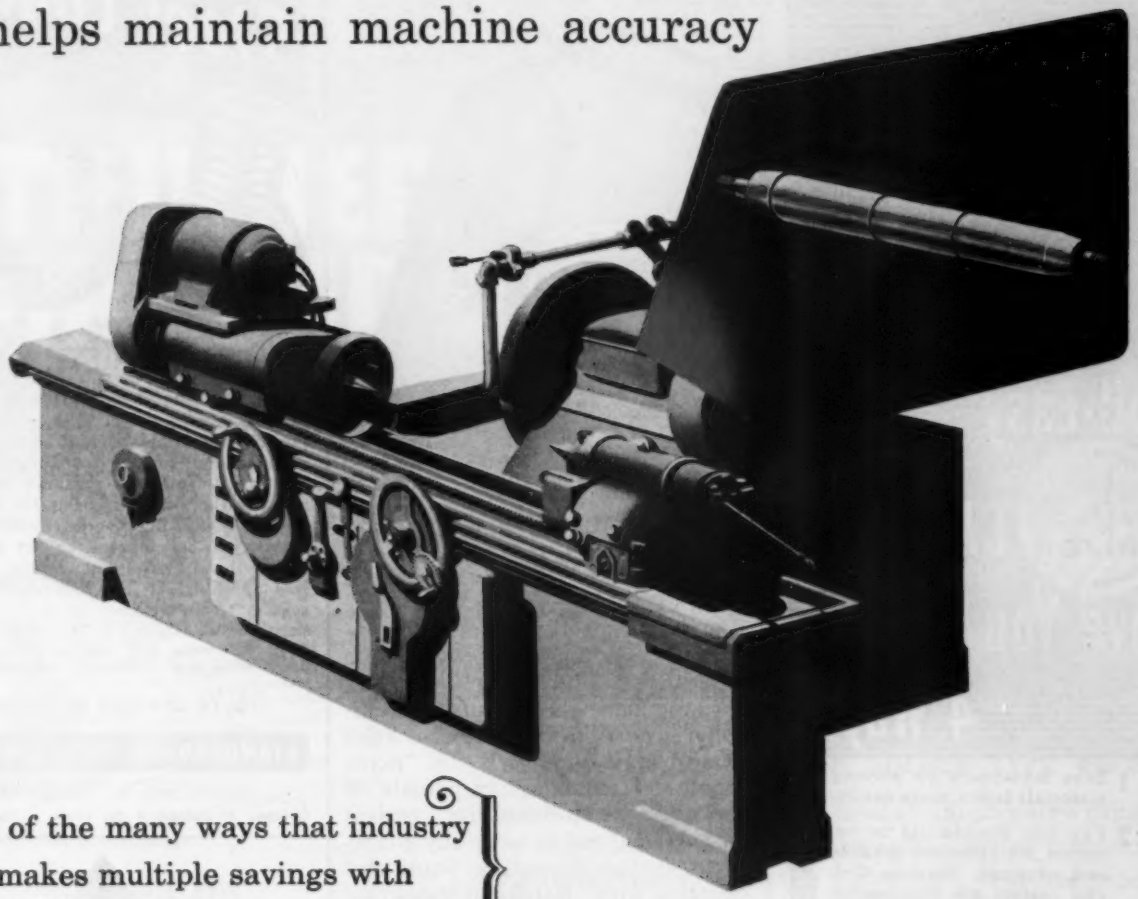
SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.

LIBERTY at 25TH PITTSBURGH 22, PA

GULFGEM OIL

provides better lubrication for spindles, helps maintain machine accuracy



One of the many ways that industry makes multiple savings with Gulf Quality Petroleum Products

Precision-built spindles in modern grinding machines operate at speeds of 10,000 r.p.m. and higher. In order that work accuracy can be maintained within a few ten-thousandths of an inch, spindle bearings must get full protection against excessive wear and sludge.

Recommended by Gulf Lubrication Engineers for this important protection job is Gulfgem Oil, the world's finest spindle lubricant. Super-refined by Gulf's exclusive Alchlor Process, Gulfgem Oil has unmatched resistance to oxidation and formation of sludge deposits—it lasts longer, and helps keep bearings clean. Outstanding lubricating qualities of Gulfgem Oil insure less wear, fewer bearing replacements, freedom from spindle vibration.

Gulfgem Oil is one of more than 400 Gulf quality oils and greases that are helping plant operating men make multiple savings through improved production and lower maintenance costs. For effective assistance on your lubrication and maintenance problems, write, wire, or phone your nearest Gulf Office today.

Gulf Oil Corporation · Gulf Refining Company

District Sales Offices:

Boston · New York · Philadelphia · Atlanta
New Orleans · Houston · Toledo

GULF MAKES AVAILABLE TOP QUALITY PASSENGER AND TRUCK TIRES . . . ASK YOUR GULF REPRESENTATIVE.

GULF INDUSTRIAL LUBRICATION

Helps make machines produce more at lower cost

Roll-Easy
Colson CASTERS
Save You Money
4 Ways

1 Save man-hours by moving materials faster, more easily.

2 Pay big dividends in reduced maintenance trouble and expense, because Colson casters are engineered and built by craftsmen — for years of trouble-free service.

3 Prevent breakage of fragile products by smooth handling over all floor surfaces.

4 Put an end to floor damage because the load-floating, roll-easy movement of Colson casters won't scratch or mar your floors.

Whether you're interested in one set of smooth quiet casters or a fleet of new trucks, Colson engineers can help you select or design equipment that will answer your materials-handling problem — exactly. Write us, or consult the yellow pages of your phone book (under "Casters" or "Trucks: Industrial") for the nearest Colson office.

THE COLSON CORPORATION
ELYRIA, OHIO

Please send free 68 page catalog —"Colson Casters"

Name_____

Position_____

Company_____

Street_____

City_____ Zone____ State_____

THE COLSON CORPORATION
ELYRIA, OHIO

6-lb. CO_2 Extinguisher

Randolph Laboratories, Inc., 8 East Kinzie St., Chicago, Ill., is producing a six-pound, portable, carbon-dioxide fire extinguisher, featuring thumb-trigger release and self-aimed nozzle.

Only one hand is required to operate the extinguisher, from the time it is removed from its bracket, until the flame is extinguished, Randolph says. With no valve or nozzles to adjust, it is said to be "panic proof". It contains six pounds of non-toxic, non-damaging carbon dioxide gas, and is especially adapted to smother flammable liquid and electrical fires. Randolph states that in Underwriters' Laboratories' official tests it extinguished a 16 sq. ft. gasoline fire in 7½ seconds.

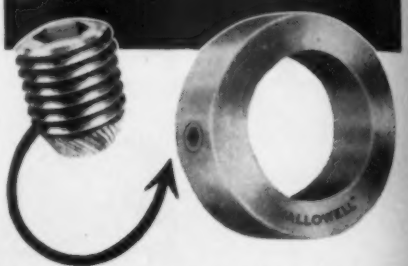
No. 126 — For further information see Page 19.

Contour Machine

Boice-Crane Co., 953 Central Ave., Toledo 6, O., says its all-purpose combination contour saw and band filer permits big time savings in cutting, filing and file broaching on small production parts, maintenance parts; irregular shaped stacked parts; spiral parts, tools,

(*Please turn to page* 178)

HALLOWELL
Steel Collars



HALLOWELL Solid Steel Collars, functionally proportioned throughout . . . precision-machined so faces run perfectly true . . . are beautifully polished all over . . . yet they cost less than common cast iron collars. 3" bore and smaller are made from Solid Bar Stock. To make sure the collar won't shift on the shaft, they are fitted with the famous UNBRAKO Knurled Point Self-Locking Socket Set Screw—the set screw that won't shake loose when once tightened. HALLOWELL . . . a "buy word" in shaft collars . . . available in a full range of sizes for IMMEDIATE DELIVERY.
Write for name and address of your nearest HALLOWELL and UNBRAKO Industrial Distributors.

OVER 47 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.
JENKINTOWN 31, PENNSYLVANIA
Chicago • Detroit • St. Louis • San Francisco

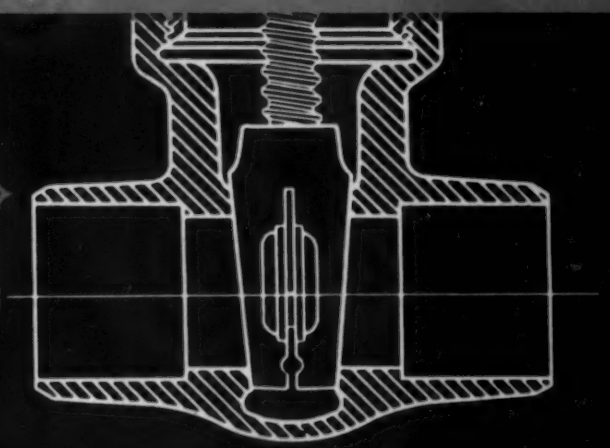
Herbrand
PRECISION
DROP FORGINGS
. . . any size or shape up to 200 lbs.

Whatever your requirements in forgings, Herbrand is your most faithful source of supply . . . as it has been for hundreds of industries since 1881. Your inquiries are solicited.

Herbrand DIVISION
THE BINGHAM-HERBRAND CORP.
FREMONT, OHIO

New...COPPER TO COPPER VALVES

WITH THINNER PIPE ENDS



for Easy Soldering

No. 28 GATE TYPE

125 lbs. W. S. P.
200 lbs. W. O. G.

This sturdy valve with non-rising stem features the hollow-cored, slotted Flexitite Disc* that assures all-around seal with seat. Also available with waste drain in ¾-in. size.

No. 29 GATE TYPE

125 lbs. W. S. P.
200 lbs. W. O. G.

This rising stem type valve is for all general service at standard pressure. Features hollow-cored, slotted Flexitite Disc* that assures all-around seal with seat.

NO. 24 GATE TYPE

100 lbs. W. S. P.
150 lbs. W. O. G.

Ideal for all full flow service for low pressure. Features the Flexitite Disc* that assures a valve that starts tight and stays tight.

CHECK THESE NEW O-B SOLDER TYPE VALVES

Quick, even distribution of heat through valve pipe ends is a must for leak-tight, copper-to-copper connections. By careful trimming of the valve wall, O-B has produced a fast-heating pipe end. Heat-wasting excess metal is eliminated without reducing the sturdiness of the valve itself.

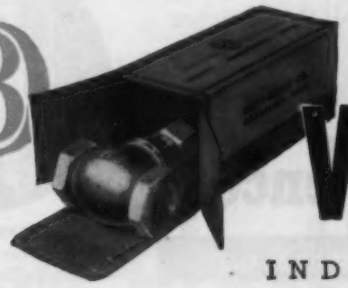
This thinner wall permits a rapid distribution ot heat through the pipe ends of the valve and assures an even flow of solder around the tubing. Carefully tapered, the pipe end walls take advantage of the inserted tubing for reinforcement resulting in a sturdy, leak-tight connection.

AVAILABLE IN THE FOLLOWING SIZES

No. 28	⅜	½	¾	1	1¼	1½	2
No. 29	⅜	½	¾	1	1¼	1½	2
No. 24	⅜	½	¾	1	1¼	1½	2
No. 6	⅜	½	¾	1	All sizes indicated in inches.		
No. 7	⅜	½	¾	1			

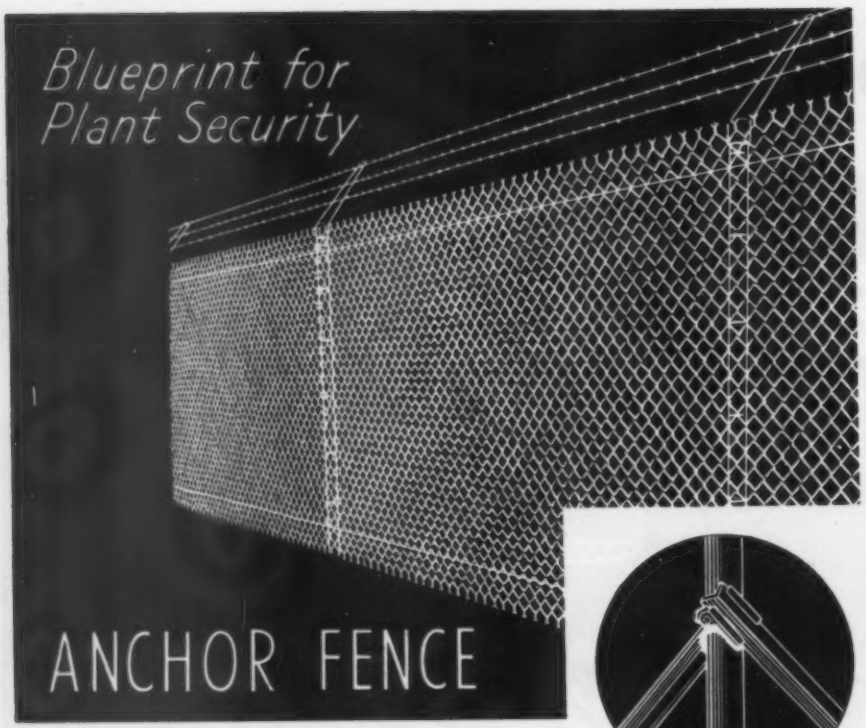
4015-V

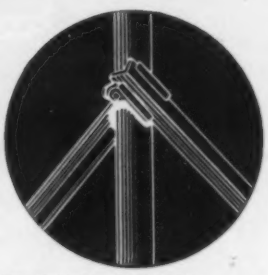
* Reg. U. S. Pat. Office



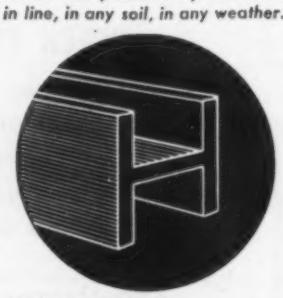
Ohio Brass VALVES

FOR DOMESTIC AND INDUSTRIAL USE





DEEP-DRIVEN ANCHORS
Hold fence permanently erect and in line, in any soil, in any weather.



H-BEAM LINE POSTS
Carbon steel, rigid and rust-free because their open construction is self-draining.

SQUARE FRAME GATES
Stronger, amazingly free from sagging and warping.

SQUARE TERMINAL POSTS
Provide increased strength, add durability and improve appearance.

WHEN you've got a rugged, long-lived Anchor Chain Link Fence guarding your plant, you're sure of the most *complete* protection! Anchor Fence keeps out trespassers, snoopers, agitators, all kinds of trouble-makers . . . stands guard night and day over valuable equipment and materials either in your plant or stored in the yard.

What's more, Anchor Chain Link Fence and Gates will help direct your plant's flow of foot and motor traffic more systematically. We'll install it where it will do the most good in giving you efficient control over production, shipping and receiving operations.

Just check the *exclusive* features that give you *longer lasting* service and protection with Anchor Fence. You can have these same advantages for your plant. Look in your 'phone book now, and call a trained Anchor Fence engineer. Or write for our big, illustrated Industrial Fence Catalog, to: ANCHOR POST FENCE DIVISION, Anchor Post Products, Inc., 6615 Eastern Ave., Baltimore 24, Maryland.

Anchor Fence
Nation-wide Sales and Erecting Service

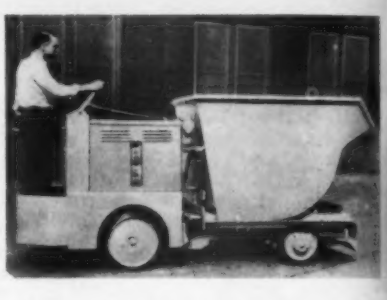
(*Continued from page* 174)

templates and stamping, forming and trimming dies.

The company calls it the first combination contour saw and band filer made with speeds of up to 4,100 blade fpm for cutting wood and other industrial materials, and speeds ranging down to 92 blade fpm for cutting tool, bar and sheet steel, brass, aluminum, cast iron and bronze, transite, and for filing a variety of metals. Rigidity of the hardened steel file guide and backer-up is said to assure rapid filing and absolutely flat work.

No. 127—For further information see Page 19

Dump Truck

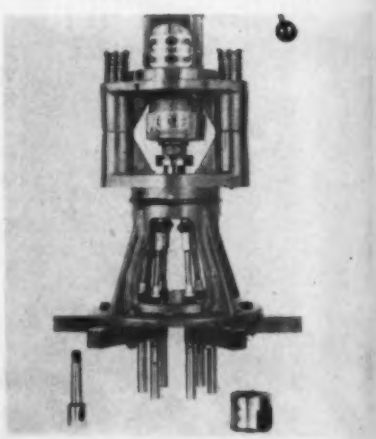


Mercury Manufacturing Co., 4016 S. Halsted St., Chicago 9, Ill., is now in production on its Model A-1015-9 battery powered electric end dump burden carrier truck.

Released by a lever near the operator, the body dumps cleanly by gravity and returns to lever latched position when emptied. Body capacity is 1½ cu. yds. and the truck load capacity is rated at 6,000 lbs. The chassis has four-wheel lever type steering, double reduction drive axle, semi-elliptic spring suspension, and mechanical contactor travel controller.

No. 128—For further information see Page 19

Tap-or-Drill Unit



A multiple spindle drilling and tapping unit that attaches to any

(*Please turn to page* 180)

READY NOW

"PLUG-IN" STRIP WITH GROUNDING FACILITIES

TYPE CF2-G

"Plug-In" Strip provides convenience in location through a s-p-r-e-a-d of outlets. Outlets every 6" or 18".

A dual-purpose, metal-clad, multi-outlet assembly—two electrical wiring systems in one.

Dual Service Receptacle (Insulator barriers removed for illustration)

Type CF2-G Grounding "Plug-In" Strip permits use of grounded or ungrounded devices *from the same outlet* . . . Will take either the new *Series 5200* 3-blade grounding plug or the standard 2-blade ungrounded plug.

STEEL FOR PERMANENCE

GROUNDED FOR SAFETY

Listed by Underwriters' Laboratories, Inc.

UNLIMITED APPLICATIONS . . . in FACTORIES . . . OFFICES . . . STORES . . . HOMES . . . HOTELS . . . APARTMENTS . . . SCHOOLS . . . HOSPITALS . . . INSTITUTIONS . . . "Plug-In" Strip is a professional material. Consult your electrical contractor for installation. *Grounding* "Plug-In" Strip meets contemplated revisions in the National Electrical Code covering grounded electrical systems. Type CF2-G Grounding "Plug-In" Strip is the quickest and easiest method of meeting grounding requirements. Write for our *free* folder "Grounding Plug-In Strip."

Everything in wiring points to NE

National Electric

PRODUCTS CORPORATION

1351 CHAMBER OF COMMERCE BUILDING, PITTSBURGH 19, PENNSYLVANIA

IT'S A
Mac-it
PRONOUNCED "MACK-IT"

Mac-it ⅛" x 2½" Hollow Set Screws have grip of more than 17,000 lbs.

Better, Faster Service with this *Complete* Mac-it Line!

Because many standard types of Mac-its are available throughout the country for quick delivery, and because specials can be engineered to your own specifications, you'll find it pays to investigate Mac-its *first.*

Mac-it's 35 years' experience in the manufacture of heat-treated, alloy steel screws is your assurance of precision, uniformity and strength. Sold through leading industrial distributors from coast to coast and in Canada. Write for new Mac-it catalog today!

Other Mac-it products include:

- Socket Head Cap Screws
- Hollow Pipe Plugs
- Stripper Bolts
- Hollow Lock Screws
- Socket Screw Keys
- Square Head Set Screws
- Hexagon Head Cap Screws

. . . and many others

Marketed Nationally Since 1913 by
STRONG, CARLISLE & HAMMOND COMPANY
Cleveland 13, Ohio

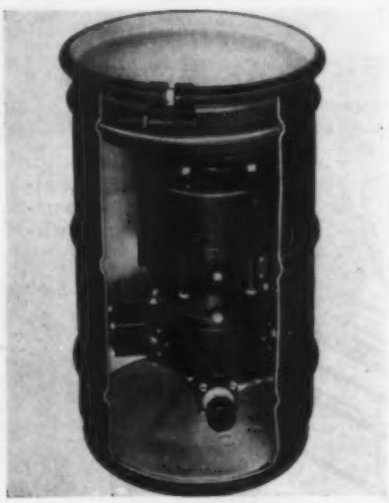
(*Continued from page* 178)

drill press and will drill or tap an infinite number of patterns has been announced by Thriftmaster Products Corp., division of Thomson Industries, Inc., 10 North Plum St., Lancaster, Pa.

Sturdy rods maintain rigid alignment and springs counterbalance weight of mutiple head, assuring sensitivity in tapping. Standard models are available with two to ten spindles, adjustable from ½" minimum centers within a 10⅜" diameter circle. The unit will take drills or taps up to ⅜" diameter in cast iron depending on centers. Universal adjustable drillhead may be replaced with any type adjustable or fixed center head of different capacity. Unit may also be disassembled and tapper or drillhead used independently.

No. 129—For further information see Page 19

Sealed Steel Container



Sealed, air-tight steel containers for maximum shipping protection for all kinds of products, from delicate instruments to heavy duty parts, are available from Steel Drum Packaging and Acc. Inc., 9505 Sandusky Ave., Cleveland 5, O.

Used during and since the war by the armed services, the drums are said to protect products from corrosion as much as ten years after packing, when a small supply of silica gel is placed inside prior to sealing. The part to be shipped is bolted down to the mounting block using its regular base plate or mounting holes. SPDA says standard inner packs of various designs have been developed, and special designs will be engineered where necessary. The containers come in 4 to 55 gal. capacity.

No. 130 — For further information see Page 19

1
SOURCE FOR ALL PARTS YOU NEED

LOCK WASHERS

High carbon steel, bronze, aluminum, stainless steel, monel metal, spring lock washers . . . finished or plated with cadmium, nickel, brass or copper. Also Garrett's Aluminum Spring Lock Washer—light in weight with strength of steel.

FLAT WASHERS

Made to meet ASA and SAE specifications in regular steel spring steel, stainless steel, brass, bronze, monel metal, aluminum, Alclad and copper. Can be plated with zinc, cadmium, nickel, brass, chrome . . . or can be parkerized.

STAMPINGS

From a small part for electronic instruments, automotive stampings and television chassis... Garrett can fabricate them better and cheaper than is possible in your own plant. Years of experience and modern high speed equipment assure speed deliveries . . . finished to your specifications.

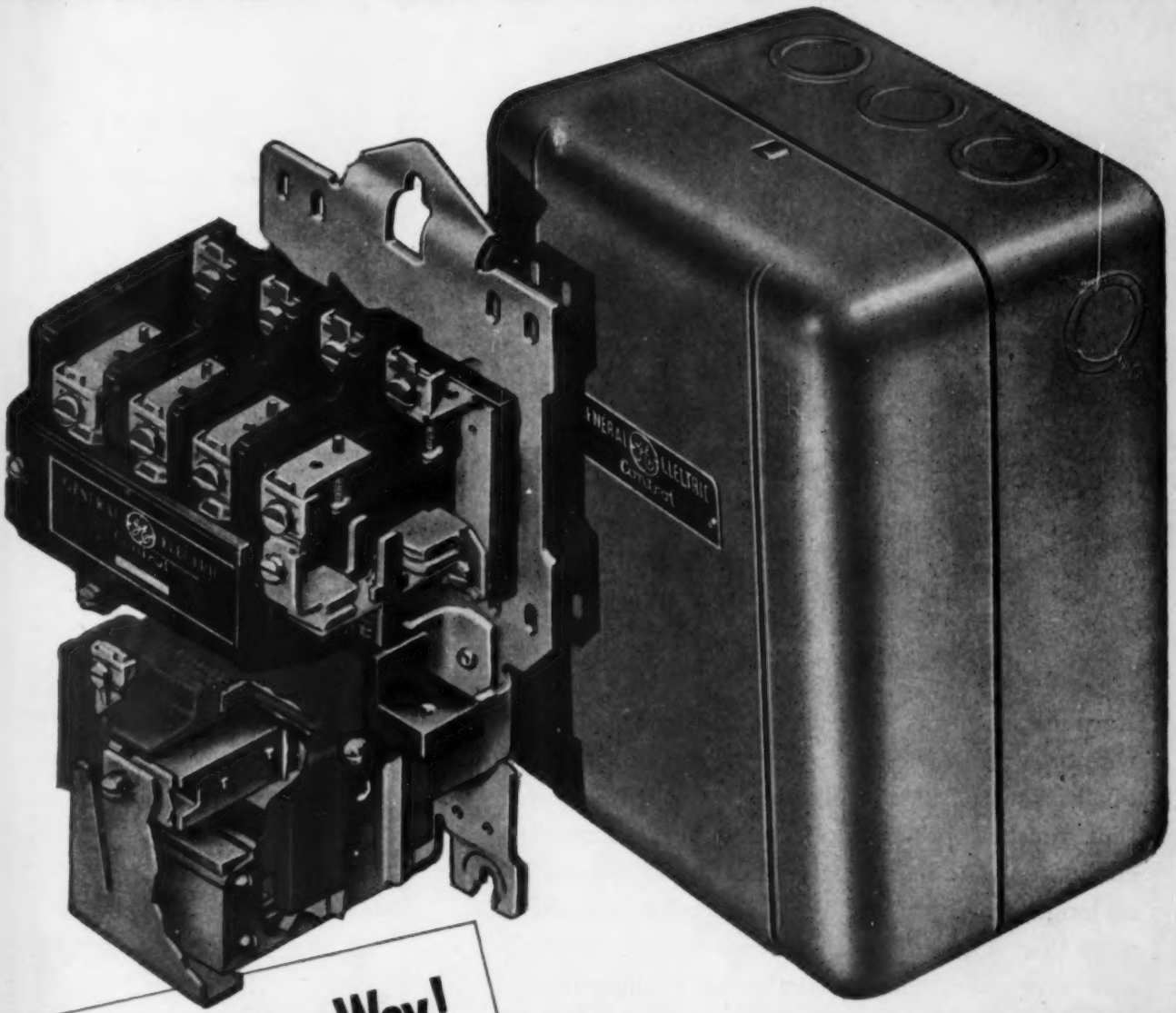
SPRINGS

Flat and coiled springs to meet every requirement. Every Garrett spring has controlled tension built into it to assure satisfactory performance under all conditions. All types of flat springs . . . coil springs — compression, extension . . . made of round, square or rectangular wire.

MANUFACTURED BY
GEORGE K. GARRETT CO., INC.
PHILADELPHIA 34, PA.

GARRETT
MANUFACTURERS OF SMALL PARTS

and COMPARE



Order this Easy Way!

Look inside. Make the screwdriver comparison test. Inspect the many new features, and we're sure you'll be enthusiastic. Just fill in the coupon at the right and we'll send you the starter immediately. Or, if you prefer, we'll be glad to send you the new, free, tell-all booklet "Look Inside and Compare" that gives more detailed information.

General Electric Company, Apparatus Department
Section N676-281, Schenectady 5, N. Y.

Send me one of the NEW CR7006 starters (size 1, 3 pole, enclosed). List Price $22.00.

_____ Check Enclosed. (Add any state or local sales or use taxes)

_____ Purchase order attached; bill to our account with: _____

_____

_____

(Name and address G-E sales office or G-E distributor.)

Motor Horsepower Rating (check one)

☐ 3 ☐ 5 Horsepower at 220 Volts
☐ 3 ☐ 5 ☐ 7½ Horsepower at 440 Volts } 60 Cycles, 3 Phase

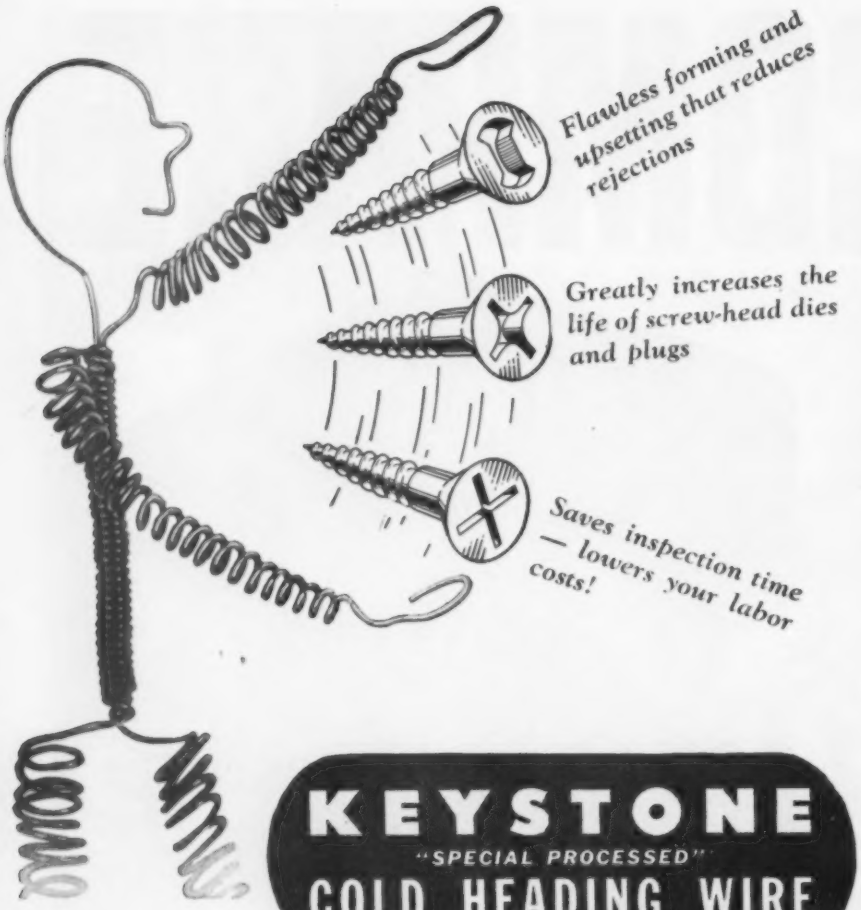
Approx. Motor Speed ☐ 1800 RPM ☐ 3600 RPM ☐ 1200 RPM

Name _____

Address _____

City _____ Zone _____ State _____

Want Additional Product Information? See Page 19.


Flawless forming and upsetting that reduces rejections
Greatly increases the life of screw-head dies and plugs
Saves inspection time — lowers your labor costs!

KEYSTONE
"SPECIAL PROCESSED"
COLD HEADING WIRE

For recessed heads, Keystone's new special-process wire delivers the desired upsetting and die forming qualities with such a high degree of uniformity that finished product rejections are practically eliminated . . . individual inspection of screws is no longer necessary . . . die and plug life are often more than doubled. This new wire effects considerable savings in the production of Phillips head, clutch head and cross recessed head screws.

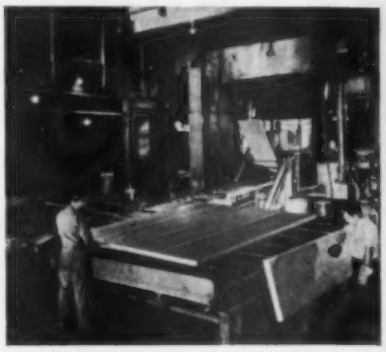
Keystone is prepared to help solve any of your industrial wire problems. If special treatment is called for, Keystone's metallurgical research and testing facilities are available to supply the answers. We welcome your inquiry.

KEYSTONE
STEEL & WIRE CO.
PEORIA . . . ILLINOIS

Special Analysis Wire, Setting New Standards of Performance

SCOVILL'S NEW CONTINUOUS STRIP MILL IN PRODUCTION

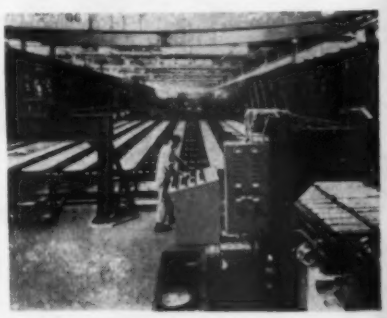
Scovill Manufacturing Company, Waterbury, Conn., has placed in operation its new $10,000,000 continuous strip mill, which it describes as capable of producing the heaviest cold-rolled and non-welded brass coils in the industry.



As bars emerge from the continuous casting machine, they are automatically sawed for delivery to the strip mill.

The heart of the new mill, completely equipped with the most modern machinery for every operation, is the exclusive flat-metal continuous casting unit, with a capacity of several million pounds per week. To match the capacity of the machine, Scovill has applied practices, equipment and production layouts hitherto utilized in part by other metal industries, but which are said to have never before been integrated into a single plant for the cold-rolling of brass strip and sheet.

Metal for the machines is melted in three electric induction furnaces, each with a capacity of 10,000-pounds per hour. The casting machine, said to be the only one of its kind in America, produces flat bars of uniform length, each weighing in excess of 2,000 pounds. The conventional operation of shearing or sawing gates from individually cast bars has been eliminated, assuring internally sound metal throughout the length, width and thickness of each bar.



All equipment for producing cold-rolled brass, from casting to packaging, is organized in straight line flow.

Machinery regulators and materials handling equipment in the new mill are the most modern and efficient available. On the cold-rolling mills, spacing between the working rolls is kept constantly uniform by photoelectric controls which compensate for varying temperatures and roll

(*Please turn to page* 186)

BRAND NEW...another Randolph "Exclusive"! the RANDOLPH "6"

20% MORE
Fire-killing CO_2!

PLUS *all the advantages of Randolph designing*

The Randolph "6" sets an entirely new standard for your all-purpose carbon dioxide fire defense. It retains the compactness of the famous Randolph "4", the time-tested one-hand action and self-aimed nozzle, the panic-proof trigger release—costs less than 3% more than 5 lb. sizes, *yet gives you 20% extra protection*—a full 6 pounds of carbon dioxide!

The "6" stops gasoline, oil, paint, grease and electrical fires in split seconds—has *enough* CO_2 to stop larger fires, more severe fires—delivers a bigger, more powerful fire-fighting punch! And, like all Randolph Portables, *anybody* can use it—you know *how* to use it just by looking at it!

Find out, right now, how the Randolph "6" can bolster YOUR fire defense. Check the prices that give you PLUS protection at practically the same cost. For a quick demonstration, complete information or immediate delivery, call or write Randolph Laboratories, Inc., 2 E. Kinzie St., Chicago 11, Ill.

Underwriters Approved

Randolph
FIRE PROTECTION EQUIPMENT

Contractor saves penalty of $500 — by investing $3.84 in Air Express

Time clause in housing project paving contract stood good chance of being invoked when equipment broke down at 5 P.M. So 10-lb. carton of replacement parts was Air Expressed from 1200 miles away. Delivered in just 8 hours. The Air Express charge was only $3.84—and contractor completed job on time.

$3.84 is small indeed, since it covers door-to-door service. Anytime delivery, 7 days a week. Makes the *world's fastest* shipping service the most convenient.

Air Express goes by Scheduled Airlines; extra dependability, *experienced* handling. Shipments keep moving. Regular use keeps *any* business moving.

Only Air Express gives you all these advantages

World's fastest shipping service.
Special door-to-door service at no extra cost.
One-carrier responsibility all the way.
1150 cities served direct by air; air-rail to 22,000 off-airline offices.
Experienced Air Express has handled over 25 million shipments.

Because of these advantages, regular use of Air Express pays. It's your best air shipping buy. For fastest shipping action, phone Air Express Division, Railway Express Agency. (Many low commodity rates in effect. Investigate.)

Rates include pick-up and delivery door to door in all principal towns and cities

A service of
Railway Express Agency and the
SCHEDULED AIRLINES of the U.S.

(*Continued from page* 184)

expansion which takes place as rolling progresses. Vacuum cup and roller handling equipment do away with laborious manual handling usually associated with brass mill work, and are big factors in eliminating dents, pits, gouges and scratches in the metal.

Through its integration of continuous casting with the most modern cold-rolling equipment and production techniques, Scovill claims to have achieved important refinements in strip and sheet brass, including:

Ability to produce the heaviest continuous cast coils in the brass industry, with no weld to pull apart and no imperfect joints to damage dies or tools:

Uniformity of chemical composition, temper and gauge from strip to strip and sheet to sheet;

Annealed and cold-rolled tempers and grain size more closely controlled than ever before;

Reduction in camber (edge-wise curvature) of strip and sheet, and practical elimination of variation in gage across width of the strip or sheet.

HEAVY DUTY SEALING TAPE

Heavy duty sealing tape for corrugated cartons named Glaskraft has been put on the market by McLaurin-Jones Co., Brookfield, Mass. It consists of two sheets of kraft laminated with asphalt in which are imbedded glass fibres for added strength. Its tear test is said to be about six times that of ordinary sealing tape. The new tape is smooth on both sides, thus assuring a good bond, neat appearance, and a good printing surface. The fibres of the tape are laid in such pattern as to give a strong tear in all directions.

NEW GE FLUORESCENT LAMPS BRING OUT FULL BEAUTY OF COLORS

New fluorescent lamps which bring out the "full beauty" of all colors, are announced by the General Electric Company's lamp department. Named "de luxe cool white" and "de luxe warm white", the former are recommended where color needs are critical and best overall color rendition is important, and the latter combines color impression with good, but not highest, light efficiency, giving vastly improved color rendition.

Two additional types are the standard cool white, and the standard warm white. The former is the "whitest" fluorescent, gives equal emphasis to all colors, and is used in offices, factories, stores and schools, or wherever high light-efficiency with cool atmosphere is important. Standard warm white combines the color impression of filament light, emphasizes warm colors, and is particularly desirable for minimizing color contrast between light sources in combined fluorescent-filament lighting systems.

(*Please turn to page* 190)

about stainless steel

Many users of stainless steel speak so glowingly of it that it would seem there is nothing stainless *can't* do. Stainless steel is more than *one* kind of specialty steel... it is a complete series of steels for many uses.

Unless the *right* stainless analysis is selected, it won't do a good job. You would expect this down-to-earth approach from Crucible. That's the measure of Crucible's half century of specialty steel leadership.

Crucible designed, built and put into operation one of the first integrated mills in this country designed specifically to hot and cold roll stainless steel. This $18,000,000 mill is an important step in Crucible's aim to supply Industry with every form of specialty steel.

Because of its excellent resistance to corrosion and wear, Crucible Stainless Steels are finding increasing application in the metal-finishing and metal-products industries.

Crucible, a pioneer in the development of stainless steels, offers you the services of an unsurpassed staff of metallurgists to help you work out your stainless application problem. These engineers and metallurgists are freely available to you. One word from you puts a background of 50 years of specialty steel leadership at your service.

CRUCIBLE STEEL COMPANY OF AMERICA,
Chrysler Building, New York 17, N. Y.

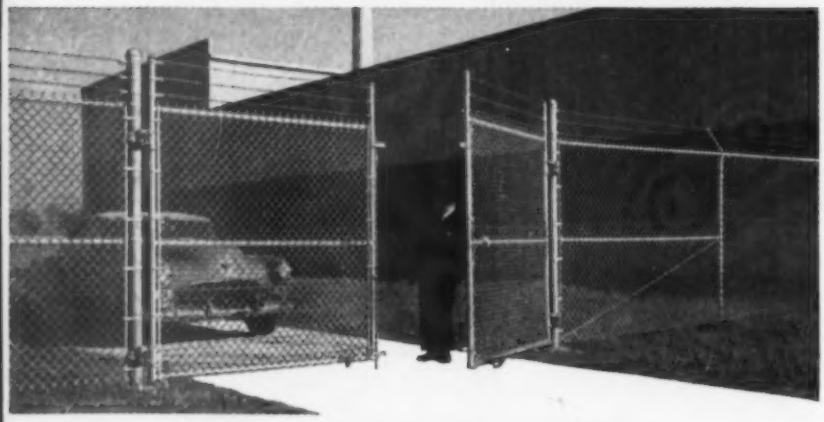
CRUCIBLE first name in special purpose steels

hot and cold rolled **STAINLESS SHEET AND STRIP**

STAINLESS • HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE • STEELS

PAGE FENCE - Since 1883

• AMERICA'S FIRST WIRE FENCE •



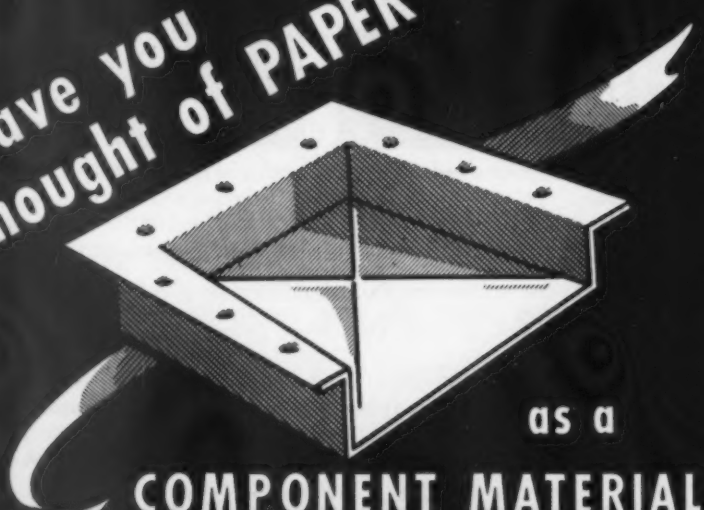
Tailored to Your Needs

● Whether you have management or operating responsibility we have a new, informative booklet that's tailored for you. It will give you valuable information on day and night protection of property and persons by means of fence that's also tailored to your requirements. Your Page Chain Link Fence can be of the style, height and metal that is best for you, no matter what the conditions. And it will be erected by experienced, local experts who offer more than a product—a complete fence service. Write for DH-142. With it we will send name and address of nearest Page Fence specialist.

Write to PAGE FENCE ASSOCIATION in Monessen, Pa., Atlanta, Bridgeport, Chicago, Denver, Detroit, Los Angeles, Philadelphia, Pittsburgh, New York or San Francisco.

PRODUCT OF PAGE STEEL & WIRE DIVISION OF AMERICAN CHAIN & CABLE COMPANY, INC.

Have you thought of PAPER



as a COMPONENT MATERIAL?

Today special papers manufactured by Central are replacing metal, cloth and many other materials . . . improving product design . . . lowering costs . . . increasing production.

There may be a place in your product where an engineered paper by Central can improve its quality or lower its cost. Consult Central Paper Engineers about your problems . . . their expert advice is yours for the asking.

REG. U.S. PAT. OFF.

CENTRAL PAPER COMPANY INC.

2446 Lakeshore Drive • Muskegon, Michigan

BRANCHES IN LEADING CITIES

HANDY SAMPLE FILE OF CORRUGATED MATERIALS

A reference file of actual samples of corrugated materials, covering a broad range of types and grades, in a kit small enough to keep on the corner of a desk or on a bookshelf, is being made available to purchasing agents and others responsible for selection of corrugated packaging and shipping materials, by the Chippewa Paper Products Co., Inc., 3315 W. 48th Place, Chicago 32, Ill.

The kit, which is styled the Chippakit, holds more than 20 labeled samples of Chippaflex flexible corrugated, and Chippewa and Chief single-faced corrugated, in the various weights, facings, flutes, etc. Full identification makes it easy to select the proper materials for developing new or improving old packages or shipping methods.

FOOT PEDAL FLUSH

Easy Flush Pedal, which converts a hand operated flushing action on toilets to a foot pedal flush, has been put on the market by Approved Products Co., 205 E. 42nd St., New York, N. Y. The pedal is designed to accommodate all flushometer and tank type water closets on both new and existing installations. No plumbing changes or shutting off of water supply are required. The device is of sturdy construction and design in polished chromium plating on heavy gauge brass. Installation time is about ten minutes.

EVAPORATIVE CONDENSER SAVES AIR CONDITIONING WATER

Water saving up to 95 per cent is possible in many types of air conditioning systems, according to L. P. Hanson, vice president in charge of sales of United States Air Conditioning Corporation, Minneapolis, Minn.

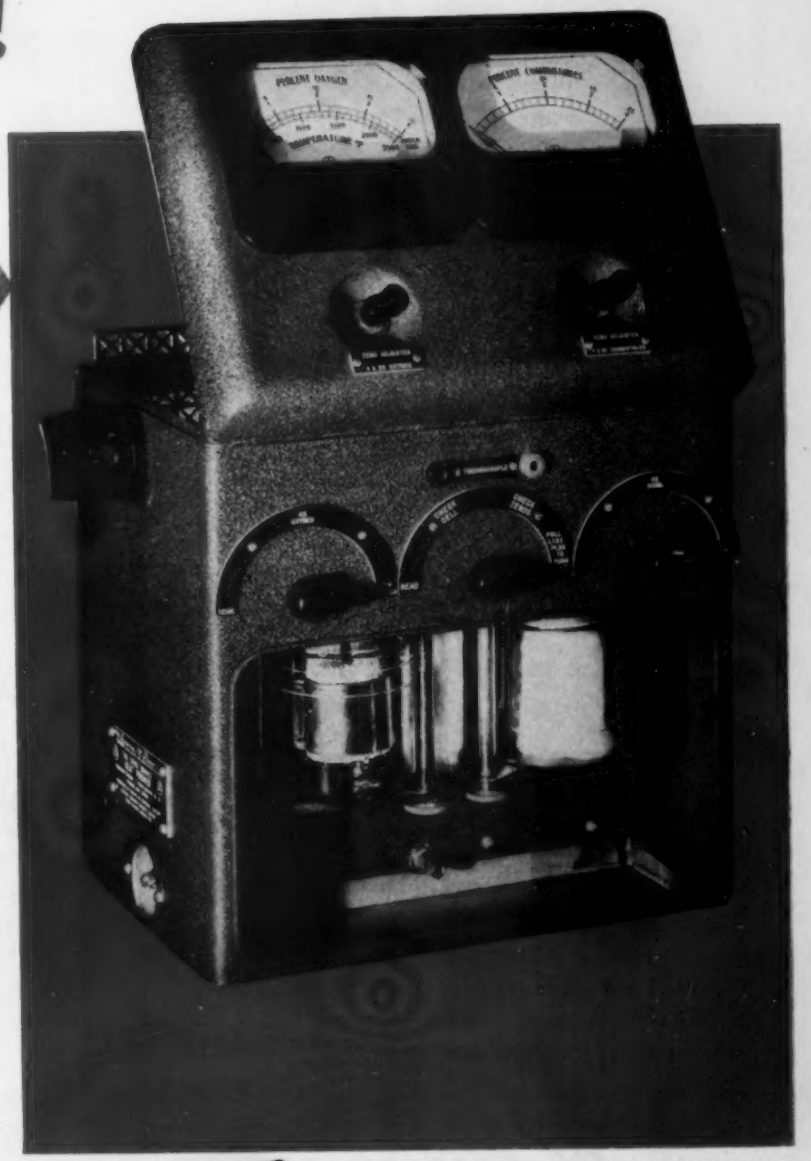
"Air conditioning systems that ordinarily require large quantities of water should be complemented with an evaporative condenser or other conservation device which will reduce water consumption to as little as 5 per cent of normal," Mr. Hanson explained.

"This saving is vital now, when many sections of the nation are facing acute

(*Please turn to page* 192)

Put this Remarkable Instrument to work!

It's the most talked-about new service in industrial lubrication



"In less than two hours after installation, this instrument showed us how to increase our production by 18%."
—Plant Superintendent

Hundreds of industrial firms including leading steel, locomotive, truck, automobile, aircraft, tool instrument manufacturers and others are profiting by this unique industrial service. There is no charge or obligation. Contact the office nearest you or write for free booklet at right.

A complete line of quality lubricants for industry:

- **Heavy Duty Motor Oils**
- **Chillo Cutting Oils**
- **Trojan Greases**
- **Cisco Compounds**
- **D-C Diesel Engine Oils**
- **Plant Machinery Oils**
- **Plus two hundred other petroleum products**

FREE!
This helpful booklet!

The Industrial Heat Prover is a *flue gas* analyzer. It tells quickly, accurately and continuously how much fuel is wasted by needlessly heating excess air . . . and how to correct this loss. Send coupon today for more information.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

CITIES SERVICE OIL COMPANY
Sixty Wall Tower, Room 552
New York 5, N. Y.

Please send me without obligation your new booklet entitled "Combustion Control for Industry."

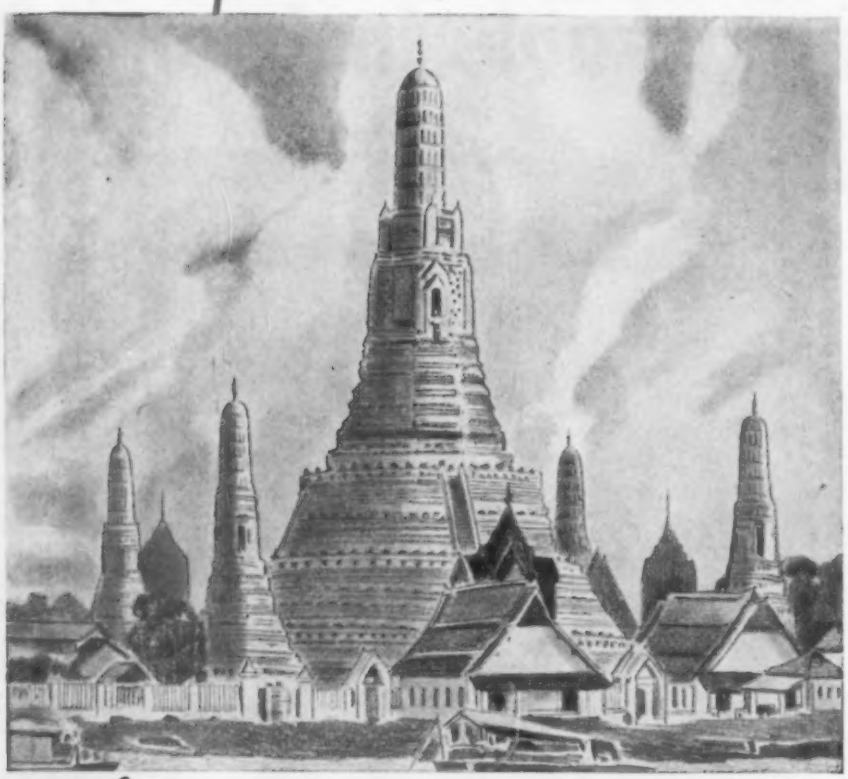
*Name*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

Triplex in Siam . . .



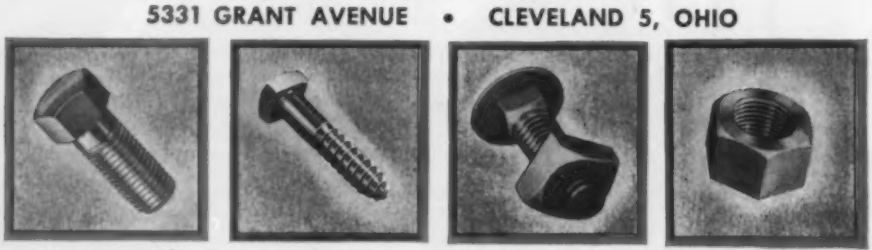
They've got to be good . . . . . to go so far!

Holding power is important in Siam, too! That's why buyers in Bangkok send their orders for threaded fasteners half way around the world—to TRIPLEX! They have learned that TRIPLEX threaded fasteners are tough, accurate and thoroughly dependable. TRIPLEX products are also exported to 54 other nations throughout the world . . . they must be good!

You may obtain a copy of the complete TRIPLEX catalog or a handy wall chart of types and sizes by simply asking for them.

The TRIPLEX SCREW Co.

5331 GRANT AVENUE • CLEVELAND 5, OHIO



CAP SCREWS | LAG BOLTS | CARRIAGE BOLTS | SEMI-FINISHED NUTS

TRIPLEX for TOUGHNESS

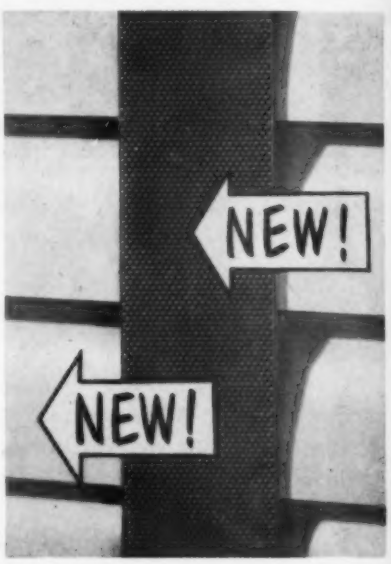
CAP AND SET SCREWS · BOLTS, NUTS AND RIVETS

(*Continued from page* 190)

water shortages and initial remedial efforts are aimed to curtailment of non-essential uses of water."

Mr. Hanson said that many of his company's commercial air conditioning systems are applications of a unit which has in it a built-in evaporative condenser. This means that in the conditioning of a 500-seat theatre using a refrigerated Kooler-aire unit or other systems with an evaporative condenser, as little as 324 gallons would be required per 9 hour day, whereas a 30 ton refrigeration unit without a water saving device would require 24,300 gallons of water per 9 hour day.

VENETIAN BLINDS THAT ASSURE LOWER MAINTENANCE COSTS



Flexalum Venetian blinds with spring tempered slats and vinyl plastic tape, which are completely washable and said to "last twice as long" are being introduced by the Hunter Douglas Corporation, 150 Broadway, New York, N. Y., and Riverside, California. The slats are made of aluminum alloy 24S, heat treated and cold worked, which will bend up to 90 deg. or around ¾" radius without deformation. They will withstand a lot of abuse and are not easily dented or deformed. The slats have an alkyd base baking enamel finish, and are available in a wide assortment of colors in addition to white, ranging from eggshell to chinese red.

A new and very practical feature is the Flexalum vinyl plastic Venetian blind tape, a cast vinyl plastic reinforced with individual pre-shrunk fortisan threads to assure dimensional stability. The tape is virtually fade-, stretch-, and shrink-proof. It is weatherproof and will not support combustion. All tape is made in duplex type, outside Duck, in white, duck, mulberry, chocolate, blue, red, green and pastel green, and to meet interior decoration requirements, may be had in two colors—for instance, duck, outside, green, inside. Tape and slats are readily cleaned with damp cloth. Printed matter available.

(*Please turn to page* 194)

Does your tag speak up?

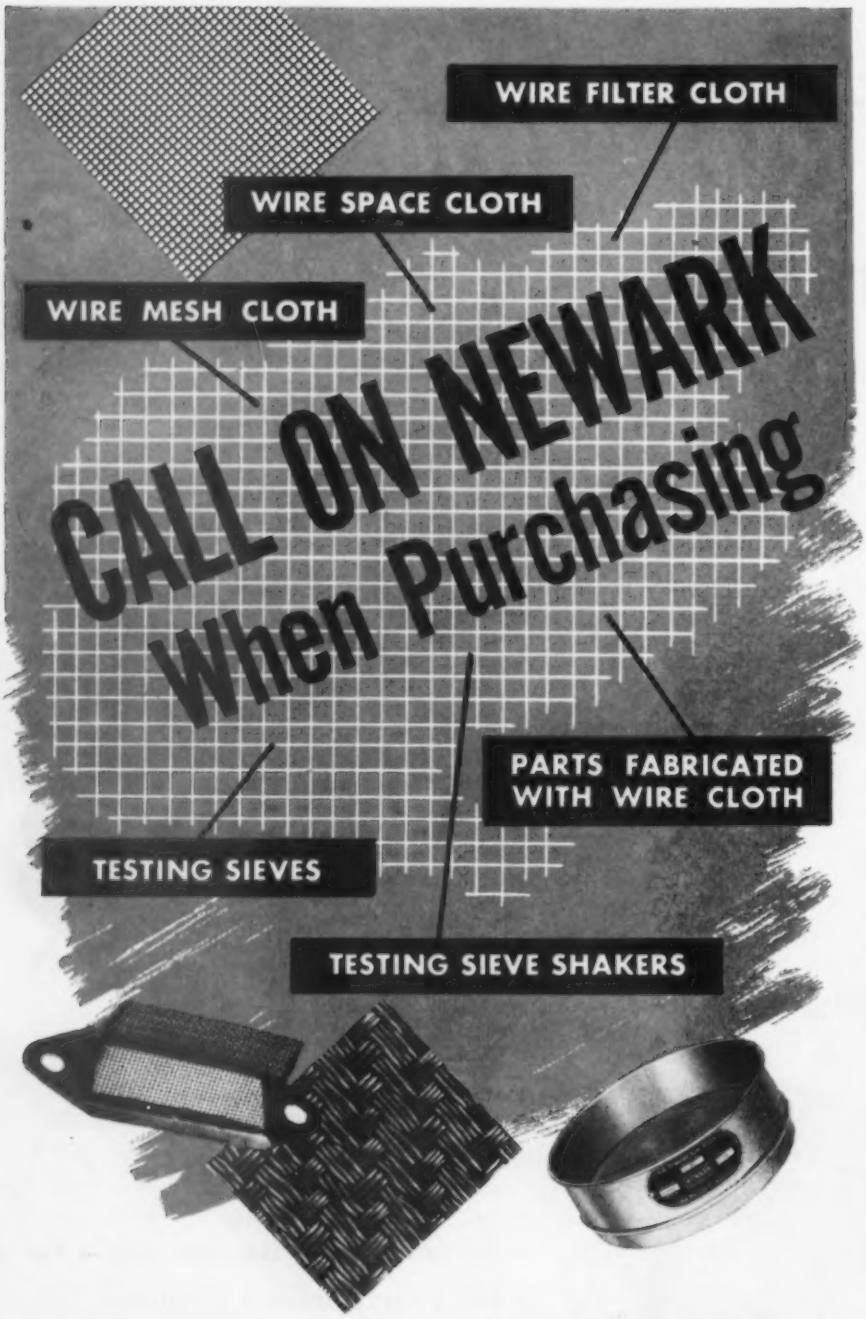
Here's a tag that does! At the point-of-sale this tag reflects the quality of Heywood-Wakefield products. It gives people easy-to-see reasons why Heywood-Wakefield is the furniture to buy.

Ashcraft
Furniture
MADE BY
HEYWOOD-WAKEFIELD
DESIGNED FOR YEAR-ROUND USE
These smartly designed Ashcraft pieces "go together" in many ingenious ways to help you live comfortably the year around. Ashcraft is truly year-round furniture. It is equally "at home" in living rooms, sunrooms, recreation rooms, dens, and on porches, patios and verandas. Lightweight, yet durable, this
STOCKING SAVER
Solid hardwood frames with rounded, smooth-as-glass edges replace old fashioned, tacked-on reed strips — so you don't tear stockings!
DECORATIVE TOUCH — Wide, strong bindings (that won't unravel) replace narrow joint windings.
TIGHT JOINTS — Compressed tenon joints, pressure-glueing, and rigidly screwed joinings assure long satisfactory service.
SEASONED HARDWOOD
Ashcraft furniture is made of seasoned New England White Ash — a wood that ranks high in shock resistance. The steam-bent frames hold their shape indefinitely.
LONG-LASTING FINISH
Water-repellent, hard-wearing spar varnish is brought to a satin-smooth gloss by skilled craftsmen. A hard finish on seasoned hardwood gives maximum serviceability.

Illustrations reduced from larger size printed in green and light orange, both sides

Do you want a tag that speaks up for your product? Dennison can put life into your point-of-sale advertising. Call the nearest Dennison Office or write Dennison Manufacturing Co., Dept. B-79, Framingham, Massachusetts.

LOOK TO Dennison FOR EXTRA VALUE IN
MATERIALS • DESIGN • WORKMANSHIP



Make NEWARK your source of supply for Wire Cloth and Wire Cloth Products. We weave all of our own cloth from which we fabricate parts for our customers...thus insuring both quality of cloth and accuracy of construction.

Newark Wire Cloth is available in all standard widths, all meshes, all commercial metals...the Newark line is a complete line even up to 400 mesh cloth. And if your problem is one of parts design, our engineers will be glad to aid. May we quote on your requirements?

NEWARK for ACCURACY

Newark Wire Cloth COMPANY

346 VERONA AVENUE • NEWARK 4, NEW JERSEY

NEW STAINLESS MAKES PRACTICAL HEADING AND UPSETTING OF PARTS

A new Chrome-Nickel austenitic stainless steel has made practical the economical production of parts which have been classed as "impossible" jobs. Such stainless parts include cold headed bolts and recessed head screws, cold upset and punched nuts, and parts that require severe cold coining and extrusion. Outstanding characteristic of the new material is that it work-hardens much slower than the conventional 18-8 types of stainless, and is therefore well suited to fabrication of fastenings and similar parts by drastic cold heading or upsetting.

Name assigned to the steel is Carpenter Stainless No. 10. Type analysis of the material, invented by The Carpenter Steel Co., Reading, Pa., is as follows: Carbon 0.08% max., Chromium 16.00%, Nickel 18.00%.

Engineers who have recognized a need for commercially produced fastenings which provide the full corrosion resistance of 18-8 stainless will find that fastenings made from Carpenter No. 10 will fill a definite need. It will no longer be necessary to specify less corrosion resistant fastenings, such as the chrome-iron type, for use in 18-8 assemblies. In addition to other types of fastenings made on a commercial scale from Carpenter Stainless No. 10, recessed-head screws are now being produced.

Because the material remains non-magnetic after severe cold working, it also has application in the making of parts for precision instruments.

Corrosion Resistance

The corrosion resistance of Carpenter Stainless No. 10 has been found to be as good as, or slightly better than, that of the conventional Types 302, 304 and 305. It resists a wide variety of organic and inorganic chemicals and foodstuffs. No. 10 resists nitric acid well, sulphuric acid moderately. It is not recommended for use with hydrochloric and other halogen acids.

Physical constants and mechanical properties of Carpenter Stainless No. 10 are as shown below:

Physical Constants

Density—lbs. per cu. in.	.29
Specific heat Btu. per lb. per ° F (32-212° F)	.12
Specific Electrical Resistance at Room Temperature—Ohms per cir. mil. ft.	476
Coefficient of Thermal Expansion—mean between 32° F and 1200° F	10.4×10^{-6}

(*Please turn to page* 196)

QUALITY
ALL THE WAY THROUGH

WEIRITE — HOT-DIP AND ELECTROLYTIC TIN PLATE, TIN MILL BLACK PLATE AND SPECIAL COATED MANUFACTURING TERNES

WEIRZIN — ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

WEIRTON — HIGH-CARBON STRIP COLD-ROLLED SPRING STEEL

WEIRALEAD — LEAD ALLOY COATED SHEETS AND LONG TERNE SHEETS

WEIRCOLOY — GALVANIZED SHEETS

N-A-X — HIGH-TENSILE LOW-ALLOY STEELS

Lacquered and Coated Products • Tie Plates • Structurals • Bars • Piling
Hot-Rolled Sheets and Strip • Cold-Rolled Sheets and Strip • Angles

WEIRTON STEEL CO.

WEIRTON, W. VA. *Sales Offices in Principal Cities*

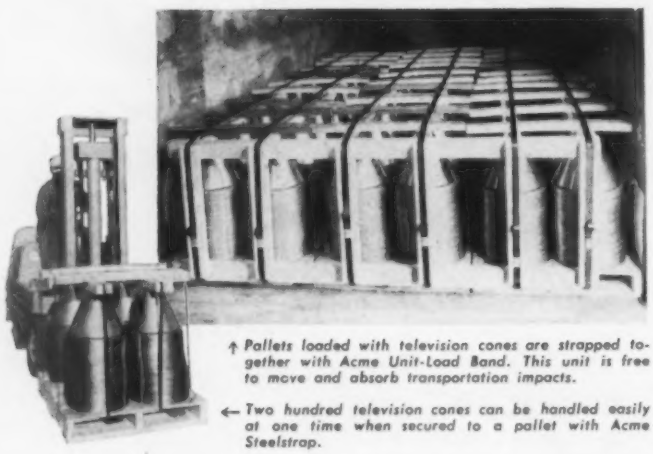
Division of NATIONAL STEEL CORPORATION *Executive Offices, Pittsburgh, Pa.*

WEIRTON STEEL COMPANY

NATIONAL STEEL

ACME STEEL CO.
CHICAGO

Still another shipper cuts handling costs, damage claims with ACME STEELSTRAP



↑ Pallets loaded with television cones are strapped together with Acme Unit-Load Band. This unit is free to move and absorb transportation impacts.

← Two hundred television cones can be handled easily at one time when secured to a pallet with Acme Steelstrap.

T-V part-maker also cuts unloading time 92%!

The Milwaukee Metal Spinning Company, pioneer manufacturer of metal television cones, finds Acme Steelstrap and Unit-Load band the perfect shipping method for its easily damaged product.

The metal cones, strapped to pallets, are loaded into half of a railroad car. A gate is placed at each end of the grouped pallets, which become a "floating" unit when bound together with Acme Unit-Load bands. The other half of the car is loaded in the same way.

This dependable bracing method assures perfect delivery, and, under normal conditions, a car can be unloaded in 1½ man-hours. The old way of using wood braces required 18 man-hours for unloading.

More than 40,000 other users prove 9 out of 10 companies can ship safer . . . and at *less* cost . . . with Acme Steelstrap and Unit-Load band. Find out how you can save, too. Mail the coupon today.

STRAPPING DIVISION
ACME STEEL COMPANY
NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 11

ACME STEEL COMPANY, Dept. P-20
2838 Archer Avenue, Chicago 8, Illinois

☐ Have representative call.
☐ Send booklet, "*Savings in Shipping.*"

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

(*Continued from page* 194)

Mechanical Properties

A Typical Tensile Test on 1" Round After Water Quenching from 2000" F.

Yield strength, .2% Offset p.s.i.	35,000
Tensile strength, lbs. per sq. in.	75,000
Elongation in 2", %	55.0
Reduction of area, %	72.0
Brinell hardness	145
Rockwell hardness	B-80

Forms Available

This new stainless steel is being produced on a commercial scale in the following forms: forging billets, hot rolled bars and forgings, cold drawn and ground bars, wire and wire rods. Complete information on physicals, cold working properties, etc. are provided in a bulletin issued by The Carpenter Steel Co., Reading, Pa.

FOOTE BROS.-LOUIS ALLIS ANNOUNCE NEW LINE OF GEARMOTORS

Foote Bros. Gear and Machine Corporation of Chicago and The Louis Allis Company of Milwaukee have recently announced a joint program for the manufacture and sale of a complete line of gearmotors.

Foote-Allis double reduction unit

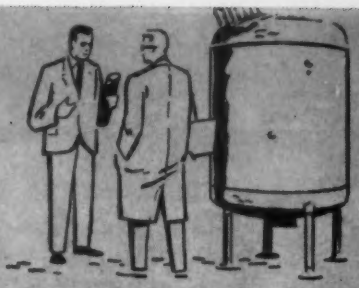
The new Foote Bros.-Louis Allis Gearmotor makes use of hard helical gears and other moving parts which have been processed and heat treated under new and improved methods of manufacturing control. These methods have produced new high standards of performance with regard to load carrying capacity, wear life, quietness of operation and compactness of design.

The new gearmotor, manufactured in 17 sizes, provides Single, Double and Triple reduction units having output speeds from 780 R.P.M. down to 7.5 R.P.M. Integral horsepower ratings from 1 through 75 horsepower are available for practically any industrial application.

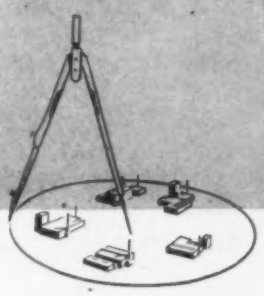
A wide selection of motor enclosures is offered, including the conventional open drip-proof, splash-proof, totally enclosed and explosion-proof construction. A.C. and D.C. motors of all types as well as motors having special electrical characteristics, are available to meet unusual installation and application requirements.

Information on the Foote Bros.-Louis Allis Gearmotor is obtainable from either company.

(*Please turn to page* 200)



EXTRAS···



···AT NO EXTRA COST

when you specify

SOLVAY

Supplying chemicals to American industry means more than meeting specifications at a price.

With Solvay . . . it means prompt, *dependable* delivery from coast-to-coast warehouse stocks . . . a continuing supply from five big plants situated in America's industrial centers.

. . . **It means** an all-inclusive *working* knowledge of alkalies, the result of sixty-nine years of experience. And Solvay's "Industry-Wise" Technical Service offers a specialized service that is exclusive with Solvay—a corps of experts who know *your* particular industry.

These "extras"—"extras" that cannot be shown in a specification, or found on a price list—are yours at no extra cost when you deal with America's leading manufacturer of alkalies. Next time you order alkalies and associated chemicals . . . specify Solvay.

SOLVAY SALES DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Boston • Charlotte • Chicago • Cincinnati • Cleveland • Detroit • Houston
New Orleans • New York • Philadelphia • Pittsburgh • St. Louis • Syracuse

SOLVAY
PRODUCTS

Soda Ash • Caustic Soda • Caustic Potash • Chlorine • Potassium Carbonate • Nytron • Calcium Chloride
Sodium Bicarbonate • Specialty Cleansers • Ammonium Bicarbonate • Sodium Nitrite • Para-dichlorobenzene
Ortho-dichlorobenzene • Monochlorobenzene • Methanol • Ammonium Chloride • Formaldehyde

Announcing

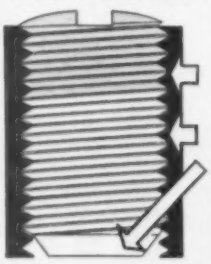
ZIP-GRIP*

Self-Locking

SET SCREWS

and ADJUSTING SCREWS

LICK VIBRATION—LOCK INSTANTLY, IN ANY GIVEN PLACE



First to have Triple-Locking Action:

1. INTERFERENCE FIT created by the larger pitch diameter of the locking thread section.

2. TENSION resulting from lifting action.

3. REGULAR SET SCREW LOCKING ACTION against the shaft or other part.

ZIP-GRIP is also the first Self-Locking Set Screw to lock without supplementary devices or deformed threads.

Write for new ZIP-GRIP Data Sheet giving detailed description and application data. Also send for complete Set Screw Catalog or write us about Special Set Screws, to suit your particular requirements; especially tough service or tricky applications.

MORE PROOF That We Specialize In Solving PUZZLING SET SCREW PROBLEMS

Set Screw & Mfg. Co.

SETKO

4017

142 Main St., Bartlett, Ill.

* Pat. Pend.

Believe it or Not...

You are paying about $22.00 a gallon for Floor Wax!

When you figure the price of floor wax, you must consider not only how much it costs to buy, but also how much it costs to use. We can demonstrate that the average cost of a gallon of floor wax is $22...and we can also demonstrate how Gerson-Stewart's new development in floor wax—SUPER SWIFT-SHEEN—can save you from 1/2 to 2/3 of that cost while giving you better floor protection and more attractive appearance. Let us give you the full facts about your floor maintenance cost. Your inquiry involves no obligation.

Gerson-Stewart personnel have been specialists in Systematized Sanitation since 1915

SYSTEMATIZED G S SANITATION

The GERSON-STEWART Corp.

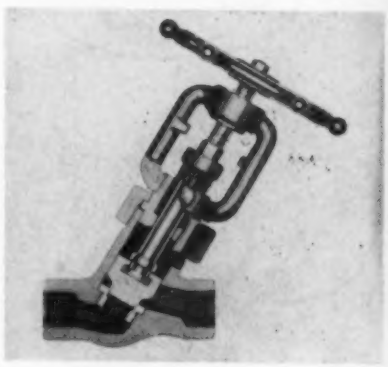
LISBON ROAD · CLEVELAND, OHIO

ANNOUNCE NEW EDITION OF LATHE OPERATORS' HANDBOOK

Publication of new and revised edition No. 49 of the book "How to Run A Lathe" is announced by the South Bend Lathe Works. Containing 128 pages and more than 350 illustrations on the care and operation of metal-working lathes, the book may be used as a reference by experienced machinists or as a text by the apprentice or shop student. New material added in the latest edition includes machinability ratings and cutting speeds for various kinds of steels, standard tolerances for press fits, running fits, push fits, and sliding fits; allowances for finish turning, filing, polishing, grinding, reaming, lapping and honing; and tooling dimensions for South Bend lathes. The new issue is available in paper binding at 25¢ or in imitation leather fabrikoid binding at $1.00 a copy postpaid. Order from the South Bend Lathe Works, South Bend 22, Ind.

* * *

ALL-PURPOSE FORGED STEEL STOP VALVES SIMPLIFY MAINTENANCE



A new line of forged steel stop valves built by Edward Valves, Inc., East Chicago, Ind., can be successfully installed in almost any service where small OS&Y steel globe or angle valves are used. These all-purpose valves, identified as the Fig. 444 series, were designed to fill the need for steel stop valves with wide applicability, good service characteristics, ease of repacking, and a reduced pressure loss.

Swing bolted packing glands and large packing chambers make any necessary repacking extremely simple. Interchangeability of parts greatly reduces maintenance inventories. Bronze yoke bushings prevent galling or freezing of stem.

Constructed of drop forged steel for greater strength, they are available with bolted or union bonnets in sizes ¼ in. through 2 in. and with screwed or socket welding ends. Built of carbon or chromium molybdenum steel for two ranges of service conditions, they are rated for 600 lb at 900 F and 1500 lb at 850 F for steam, oil, and gas service.

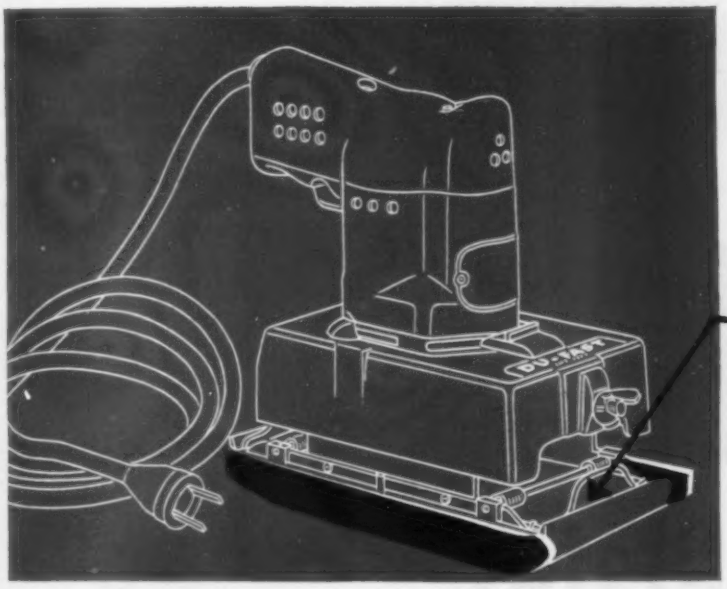
These all-purpose valves are now available for shipment from stock in most sizes. Write for free Bulletin 501 for more details.

(*Please turn to page* 202)

to an imaginative product designer . . .

Spongex® resilience

yielded this idea



to become

this product feature

Du-Fast sander and polisher attachment for home utility ¼" electric drill., Attachment only by Du-Fast, Inc., N. Y.

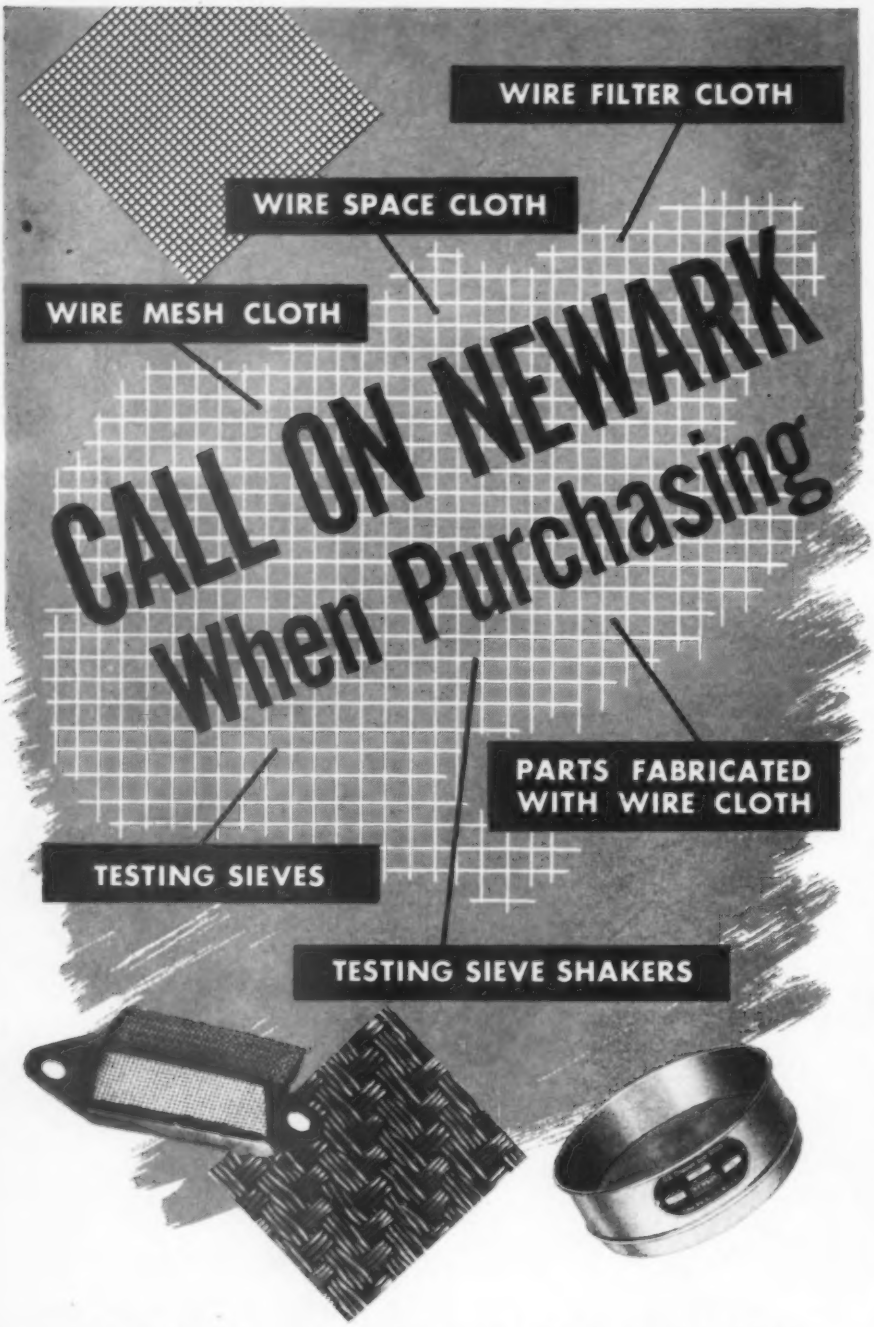
• Cellular rubber does not become a "product" until you make it one in *your* application of its known qualities as insulation against shock, vibration, sound and air and temperature transmission.

Du-Fast, Inc., wanted a sander/polisher block sufficiently resilient for conformation to curved and irregular surfaces, yet firm enough for efficient sanding and polishing. Du-Fast got the resiliency they wanted in the illustrated *Spongex* form compounded for the desired density and compression range and molded to the specifications of the unit it serves.

In every industry there exists problems that *Spongex* cellular rubber may solve. Think about it. If your thoughts are on vibration, insulation, cushioning, gasketing, sealing or sound damping, we can be your greatest help.

THE SPONGE RUBBER PRODUCTS COMPANY

304 Derby Place, Shelton, Conn.



Make NEWARK your source of supply for Wire Cloth and Wire Cloth Products. We weave all of our own cloth from which we fabricate parts for our customers...thus insuring both quality of cloth and accuracy of construction.

Newark Wire Cloth is available in all standard widths, all meshes, all commercial metals...the Newark line is a complete line even up to 400 mesh cloth. And if your problem is one of parts design, our engineers will be glad to aid. May we quote on your requirements?

NEWARK for ACCURACY

Newark Wire Cloth COMPANY

346 VERONA AVENUE • NEWARK 4, NEW JERSEY

NEW STAINLESS MAKES PRACTICAL HEADING AND UPSETTING OF PARTS

A new Chrome-Nickel austenitic stainless steel has made practical the economical production of parts which have been classed as "imposssible" jobs. Such stainless parts include cold headed bolts and recessed head screws, cold upset and punched nuts, and parts that require severe cold coining and extrusion. Outstanding characteristic of the new material is that it work-hardens much slower than the conventional 18-8 types of stainless, and is therefore well suited to fabrication of fastenings and similar parts by drastic cold heading or upsetting.

Name assigned to the steel is Carpenter Stainless No. 10. Type analysis of the material, invented by The Carpenter Steel Co., Reading, Pa., is as follows: Carbon 0.08% max., Chromium 16.00%, Nickel 18.00%.

Engineers who have recognized a need for commercially produced fastenings which provide the full corrosion resistance of 18-8 stainless will find that fastenings made from Carpenter No. 10 will fill a definite need. It will no longer be necessary to specify less corrosion resistant fastenings, such as the chrome-iron type, for use in 18-8 assemblies. In addition to other types of fastenings made on a commercial scale from Carpenter Stainless No. 10, recessed-head screws are now being produced.

Because the material remains non-magnetic after severe cold working, it also has application in the making of parts for precision instruments.

Corrosion Resistance

The corrosion resistance of Carpenter Stainless No. 10 has been found to be as good as, or slightly better than, that of the conventional Types 302, 304 and 305. It resists a wide variety of organic and inorganic chemicals and foodstuffs. No. 10 resists nitric acid well, sulphuric acid moderately. It is not recommended for use with hydrochloric and other halogen acids.

Physical constants and mechanical properties of Carpenter Stainless No. 10 are as shown below:

Physical Constants

Density—lbs. per cu. in.	.29
Specific heat Btu. per lb. per ° F (32-212° F)	.12
Specific Electrical Resistance at Room Temperature—Ohms per cir. mil. ft.	476
Coefficient of Thermal Expansion—mean between 32° F and 1200° F	10.4×10^{-6}

(*Please turn to page* 196)

QUALITY
ALL THE WAY THROUGH

WEIRITE — HOT-DIP AND ELECTROLYTIC TIN PLATE, TIN MILL BLACK PLATE AND SPECIAL COATED MANUFACTURING TERNES

WEIRZIN — ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

WEIRTON — HIGH-CARBON STRIP COLD-ROLLED SPRING STEEL

WEIRALEAD — LEAD ALLOY COATED SHEETS AND LONG TERNE SHEETS

WEIRCOLOY — GALVANIZED SHEETS

N-A-X — HIGH-TENSILE LOW-ALLOY STEELS

Lacquered and Coated Products • Tie Plates • Structurals • Bars • Piling
Hot-Rolled Sheets and Strip • Cold-Rolled Sheets and Strip • Angles

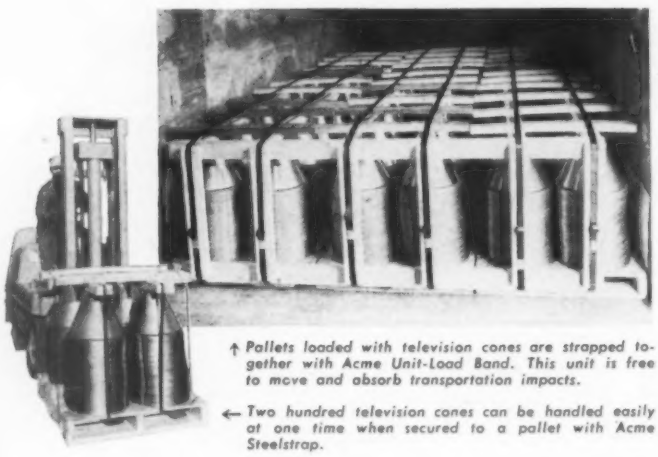
WEIRTON STEEL CO.

WEIRTON, W. VA. *Sales Offices in Principal Cities*

Division of NATIONAL STEEL CORPORATION *Executive Offices, Pittsburgh, Pa.*

Still another shipper cuts handling costs, damage claims with ACME STEELSTRAP

ACME STEEL CO. CHICAGO



↑ *Pallets loaded with television cones are strapped together with Acme Unit-Load Band. This unit is free to move and absorb transportation impacts.*

← *Two hundred television cones can be handled easily at one time when secured to a pallet with Acme Steelstrap.*

T-V part-maker also cuts unloading time 92%!

The Milwaukee Metal Spinning Company, pioneer manufacturer of metal television cones, finds Acme Steelstrap and Unit-Load band the perfect shipping method for its easily damaged product.

The metal cones, strapped to pallets, are loaded into half of a railroad car. A gate is placed at each end of the grouped pallets, which become a "floating" unit when bound together with Acme Unit-Load bands. The other half of the car is loaded in the same way.

This dependable bracing method assures perfect delivery, and, under normal conditions, a car can be unloaded in 1½ man-hours. The old way of using wood braces required 18 man-hours for unloading.

More than 40,000 other users prove 9 out of 10 companies can ship safer . . . and at *less* cost . . . with Acme Steelstrap and Unit-Load band. Find out how you can save, too. Mail the coupon today.

STRAPPING DIVISION

ACME STEEL COMPANY

NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 11

ACME STEEL COMPANY, Dept. P-20
2838 Archer Avenue, Chicago 8, Illinois

☐ Have representative call.
☐ Send booklet, "*Savings in Shipping.*"

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

(*Continued from page* 194)

Mechanical Properties

A Typical Tensile Test on 1" Round After Water Quenching from 2000" F.

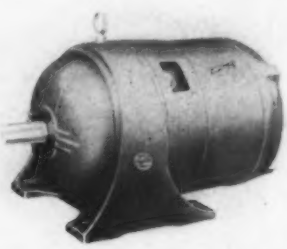
Yield strength, .2% Offset p.s.i.	35,000
Tensile strength, lbs. per sq. in.	75,000
Elongation in 2", %	55.0
Reduction of area, %	72.0
Brinell hardness	145
Rockwell hardness	B-80

Forms Available

This new stainless steel is being produced on a commercial scale in the following forms: forging billets, hot rolled bars and forgings, cold drawn and ground bars, wire and wire rods. Complete information on physicals, cold working properties, etc. are provided in a bulletin issued by The Carpenter Steel Co., Reading, Pa.

FOOTE BROS.-LOUIS ALLIS ANNOUNCE NEW LINE OF GEARMOTORS

Foote Bros. Gear and Machine Corporation of Chicago and The Louis Allis Company of Milwaukee have recently announced a joint program for the manufacture and sale of a complete line of gearmotors.



Foote-Allis double reduction unit

The new Foote Bros.-Louis Allis Gearmotor makes use of hard helical gears and other moving parts which have been processed and heat treated under new and improved methods of manufacturing control. These methods have produced new high standards of performance with regard to load carrying capacity, wear life, quietness of operation and compactness of design.

The new gearmotor, manufactured in 17 sizes, provides Single, Double and Triple reduction units having output speeds from 780 R.P.M. down to 7.5 R.P.M. Integral horsepower ratings from 1 through 75 horsepower are available for practically any industrial application.

A wide selection of motor enclosures is offered, including the conventional open drip-proof, splash-proof, totally enclosed and explosion-proof construction. A.C. and D.C. motors of all types as well as motors having special electrical characteristics, are available to meet unusual installation and application requirements.

Information on the Foote Bros.-Louis Allis Gearmotor is obtainable from either company.

(*Please turn to page* 200)

Skillful Molding

runs rings around mirrors

Our molding "know-how" was put to a new test in producing the Hood Ring for this Anco Spot-Master. The ring had to be highly flexible since it had to *stretch* around the mirror glass in assembling—it also had to be molded in such a way as to eliminate any possible visual diffusion or glare.

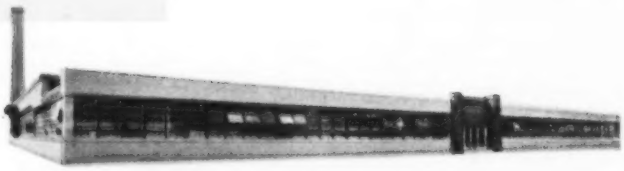
Solution of both problems first of all required the all-important but too often neglected, *careful* selection of the *correct* plastic material. Proper design, sound engineering and skillful molding craftsmanship did the rest.

Our ability to mold finer plastic products has now been greatly increased by our new plant—America's most modern plastics molding establishment. Let us put these new facilities plus our broad experience to work for you. You're sure to get better plastic products with greater sales appeal.

Spot-Master Mirror Ring Molded for Anderson Company, Gary, Indiana

Write on your letterhead for the new injection Molded and Extruded Plastics catalogue. Or, for detailed information about MILLS-PLASTIC* pipe tubing and fittings, write for circulars containing data and illustrations.

*T. M. Reg.



ELMER E. MILLS CORPORATION

INJECTION MOLDERS and EXTRUDERS of: Tenite, Lumarith, Plastacele, Lucite, Nylon, Ethyl Cellulose, Plexiglas, Polystyrene, Styron, Loalin, Vinylite, Geon, Plexene, Polyethylene, Cerex, Forticel, MILLS-PLASTIC*, Saran, and other Thermoplastic Materials.

2930 NORTH ASHLAND AVENUE • CHICAGO 13, ILLINOIS

COPPER ALLOY BULLETIN

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared Each Month by BRIDGEPORT BRASS COMPANY "Bridgeport" *Headquarters for BRASS, BRONZE and COPPER*

In a line in the center of the photograph is the body with base and cover in front. At the front left are the two half sections of the spout—Courtesy Manning-Bowman Co., Meriden, Conn.

Improved Quality, Reduced Costs Possible Through Brass

Product designers are striving hard to keep their goods ahead of the procession in the steadily growing buyers' market. Many old methods of manufacture are being discarded and materials are being selected with greater care to market goods of higher quality and, if possible, at a lower cost.

Use of stampings and screw machine parts to replace castings, especially where finishing and plating are necessary, is becoming more common. High foundry costs and the need to reduce expensive finishing operations and high scrap losses, is behind this trend.

The electric coffee percolator, manufactured by Manning, Bowman Co., Meriden, Conn., serves as an ideal example of the efforts of the product designer to meet active competition.

The percolator, excluding heating unit, glass top and handle, has four main parts — body, cover, spout and base which contains the heating unit.

Low brass, 80% copper and 20% zinc, is used for the body and bottom while commercial bronze strip metal, 90% copper and 10% zinc, is used for the cover and the two-piece spout.

Slush Casting Eliminated

For many years white metal slush castings were used for spouts. However, despite the low cost, there were many disadvantages in this type of spout: the nickel-chrome plate had a tendency to peel and the color tone was rarely a perfect match to the body.

Now, the spout is fabricated from two stampings of commercial bronze. This is more ductile than 80-20 yet work hardens enough so that after press forming, danger of denting is minimized. Silver solder joins the two sections together and to the body.

Mechanical Strength High

Since the base and body are subjected to danger of denting during normal use in the home, 80-20 brass was selected due to its naturally high tensile strength and hardness which are increased greatly through the cold working operations.

From the manufacturing side this brass is subjected to rough treatment in the bulging operation put on the body. Bulging is a stretching operation and the metal must have sufficient tensile strength to keep from tearing.

Buffing is also facilitated on this alloy because a fine grain structure is assured through care in annealing.

Bead and rolled grooves at the top of the body and the base increase the beauty of the product and stiffen the sections for greater strength.

Nickel Silver for White Color Base

An interesting use of an alloy for color as well as corrosion resistance is found in the piece which receives the valve in the base of the percolator.

Nickel silver, 65% copper and 18% nickel, is used for this part. Due to continual insertions and removing of the coffee tube, wear is quite high. Although this part is nickel-chrome plated, the plate wears off in time. With nickel silver the white color remains despite wear, keeping the inside of the percolator shiny and clean.

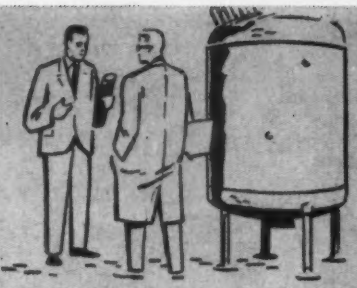
In a product such as this, copper-base alloys give the ultimate in beauty, ability to withstand abuse and wear, as well as corrosion. Added to this is the ease with which these alloys can be worked, buffed and plated.

Metal problems involving reduction in manufacturing costs through change in alloys and temper will gladly be handled by our Metallurgical Laboratory — Contact our nearest District Office for Bridgeport service.

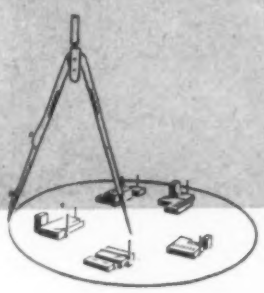
BRASS • BRONZE • COPPER • DURONZE — STRIP • ROD • WIRE • TUBING

MILLS IN
BRIDGEPORT, CONNECTICUT
INDIANAPOLIS, INDIANA
In Canada:
Noranda Copper and Brass Limited, Montreal

BRIDGEPORT BRASS COMPANY
BRIDGEPORT 2, CONNECTICUT
Established 1865
"Bridgeport" *District Offices and Warehouses in Principal Cities*



EXTRAS···



···AT NO EXTRA COST

when you specify

SOLVAY

Supplying chemicals to American industry means more than meeting specifications at a price.

With Solvay . . . it means prompt, *dependable* delivery from coast-to-coast warehouse stocks . . . a continuing supply from five big plants situated in America's industrial centers.

. . . **It means** an all-inclusive *working* knowledge of alkalies, the result of sixty-nine years of experience. And Solvay's "Industry-Wise" Technical Service offers a specialized service that is exclusive with Solvay—a corps of experts who know *your* particular industry.

These "extras"—"extras" that cannot be shown in a specification, or found on a price list—are yours at no extra cost when you deal with America's leading manufacturer of alkalies. Next time you order alkalies and associated chemicals . . . specify Solvay.

SOLVAY SALES DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Boston • Charlotte • Chicago • Cincinnati • Cleveland • Detroit • Houston
New Orleans • New York • Philadelphia • Pittsburgh • St. Louis • Syracuse

SOLVAY
PRODUCTS

Soda Ash • Caustic Soda • Caustic Potash • Chlorine • Potassium Carbonate • Nytron • Calcium Chloride
Sodium Bicarbonate • Specialty Cleansers • Ammonium Bicarbonate • Sodium Nitrite • Para-dichlorobenzene
Ortho-dichlorobenzene • Monochlorobenzene • Methanol • Ammonium Chloride • Formaldehyde

Want Additional Product Information? See Page 19.

Announcing

ZIP-GRIP*

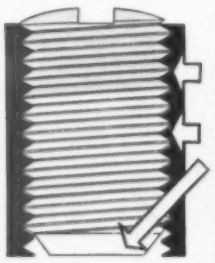
Self-Locking

SET SCREWS

and ADJUSTING SCREWS

LICK VIBRATION—LOCK INSTANTLY,

IN ANY GIVEN PLACE



First to have Triple-Locking Action:

1. INTERFERENCE FIT created by the larger pitch diameter of the locking thread section.

2. TENSION resulting from lifting action.

3. REGULAR SET SCREW LOCKING ACTION against the shaft or other part.

ZIP-GRIP is also the first Self-Locking Set Screw to lock without supplementary devices or deformed threads.

Write for new ZIP-GRIP Data Sheet giving detailed description and application data. Also send for complete Set Screw Catalog or write us about Special Set Screws, to suit your particular requirements; especially tough service or tricky applications.

MORE PROOF That We Specialize In Solving PUZZLING SET SCREW PROBLEMS

4017

Set Screw & Mfg. Co.

SETKO

142 Main St., Bartlett, Ill.

* Pat. Pend.

Believe it or Not...

You are paying about $22.00 a gallon for Floor Wax!

When you figure the price of floor wax, you must consider not only how much it costs to buy, but also how much it costs to use. We can demonstrate that the average cost of a gallon of floor wax is $22...and we can also demonstrate how Gerson-Stewart's new development in floor wax—SUPER SWIFT-SHEEN—can save you from 1/2 to 2/3 of that cost while giving you better floor protection and more attractive appearance. Let us give you the full facts about your floor maintenance cost. Your inquiry involves no obligation.

Gerson-Stewart personnel have been specialists in Systematized Sanitation since 1915

The GERSON-STEWART Corp.

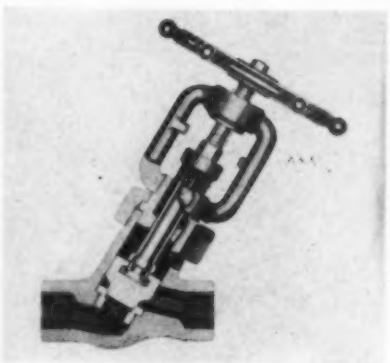
LISBON ROAD · CLEVELAND, OHIO

ANNOUNCE NEW EDITION OF LATHE OPERATORS' HANDBOOK

Publication of new and revised edition No. 49 of the book "How to Run A Lathe" is announced by the South Bend Lathe Works. Containing 128 pages and more than 350 illustrations on the care and operation of metal-working lathes, the book may be used as a reference by experienced machinists or as a text by the apprentice or shop student. New material added in the latest edition includes machinability ratings and cutting speeds for various kinds of steels, standard tolerances for press fits, running fits, push fits, and sliding fits; allowances for finish turning, filing, polishing, grinding, reaming, lapping and honing; and tooling dimensions for South Bend lathes. The new issue is available in paper binding at 25¢ or in imitation leather fabrikoid binding at $1.00 a copy postpaid. Order from the South Bend Lathe Works, South Bend 22, Ind.

* * *

ALL-PURPOSE FORGED STEEL STOP VALVES SIMPLIFY MAINTENANCE



A new line of forged steel stop valves built by Edward Valves, Inc., East Chicago, Ind., can be successfully installed in almost any service where small OS&Y steel globe or angle valves are used. These all-purpose valves, identified as the Fig. 444 series, were designed to fill the need for steel stop valves with wide applicability, good service characteristics, ease of repacking, and a reduced pressure loss.

Swing bolted packing glands and large packing chambers make any necessary repacking extremely simple. Interchangeability of parts greatly reduces maintenance inventories. Bronze yoke bushings prevent galling or freezing of stem.

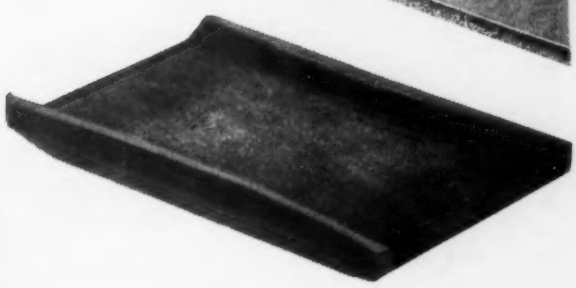
Constructed of drop forged steel for greater strength, they are available with bolted or union bonnets in sizes ¼ in. through 2 in. and with screwed or socket welding ends. Built of carbon or chromium molybdenum steel for two ranges of service conditions, they are rated for 600 lb at 900 F and 1500 lb at 850 F for steam, oil, and gas service.

These all-purpose valves are now available for shipment from stock in most sizes. Write for free Bulletin 501 for more details.

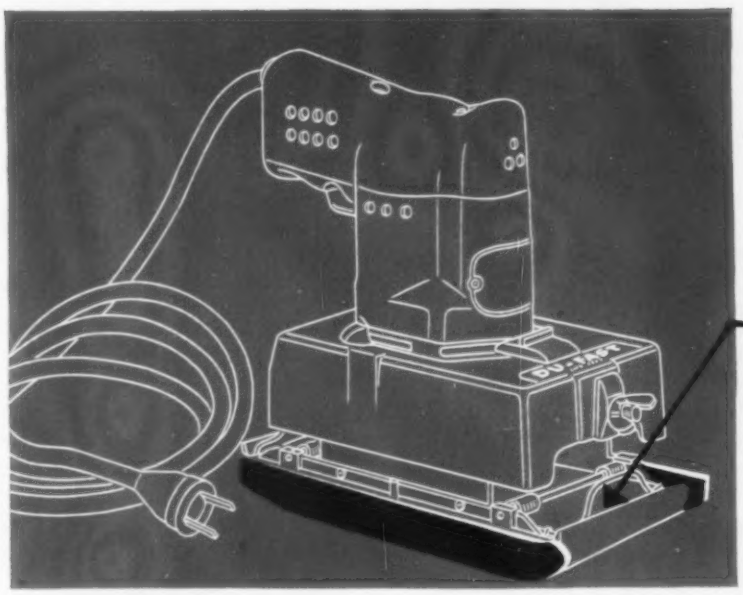
(*Please turn to page* 202)

to an imaginative product designer . . .

Spongex® resilience



yielded this idea



to become

this product feature

Du-Fast sander and polisher attachment for home utility ¼" electric drill. Attachment only by Du-Fast, Inc., N. Y.

• Cellular rubber does not become a "product" until you make it one in *your* application of its known qualities as insulation against shock, vibration, sound and air and temperature transmission.

Du-Fast, Inc., wanted a sander/polisher block sufficiently resilient for conformation to curved and irregular surfaces, yet firm enough for efficient sanding and polishing. Du-Fast got the resiliency they wanted in the illustrated *Spongex* form compounded for the desired density and compression range and molded to the specifications of the unit it serves.

In every industry there exists problems that *Spongex* cellular rubber may solve. Think about it. If your thoughts are on vibration, insulation, cushioning, gasketing, sealing or sound damping, we can be your greatest help.

THE SPONGE RUBBER PRODUCTS COMPANY

304 Derby Place, Shelton, Conn.

ASK US TO QUOTE ON Name Plates

Send us your designs and specifications. Or, if you wish, our Art Department is available to help in preparing distinctive name plates for your products. We will gladly quote on your requirements, without obligation. Etched or lithographed on metal, Ecoa name plates are *permanent marks of distinction* which reflect quality and add sales appeal to your product. They look better—longer.

THIS BOOK CAN SAVE YOU MONEY

By choosing from nearly 5000 shapes and sizes for which we have dies on hand you can save the cost of special dies. Your design and engineering departments will get real money-saving ideas from this book. Write for your copy now on your letterhead.

ETCHING COMPANY OF AMERICA

1520 Montana St., Chicago 14, Ill., Dept. C-2

Metal Name Plates, Dials and Panels, Etched or Lithographed • Etched Metal Scales, Clock Dials, Trophy Plates, Plaques, Art Novelties, Advertising Specialties • Etched Metal Panels for elevator and architectural uses • Lithographed or Screened Plastic Name Plates or Dials.

SUBSIDIARY OF DODGE MANUFACTURING CORPORATION, MISHAWAKA, INDIANA

TEST COAL-BURNING GAS TURBINE

A locomotive-size gas turbine operating with pulverized coal as its fuel, was recently demonstrated before leading railroad and coal company officials at Dunkirk, New York. According to R. B. White of Baltimore, chairman of the Locomotive Development Committee of Bituminous Coal Research, Inc., the tests have shown that pulverized coal can be fed continuously to a combustion chamber and burned efficiently under a pressure of 60 pounds per square inch.

The coal-burning gas turbine has only three major components;—the compressor, the combustor and the turbine. The gas which drives the turbine is superheated air. The gas turbine, is simple, compact, requires minimum lubrication and attention and operates without smoke. It eliminates the need for water.

"While it would be premature to assume that all of the technical problems are solved," Mr. White said, "the tests have shown that bituminous coal can operate a gas turbine. We are particularly pleased with the combustion efficiency, in excess of 90%, and also with the performance of the ash removal equipment. Inspection of the experimental turbine following a 38-hour run, showed that all components of the coal-burning gas turbine power plant were in excellent condition."

NEW TRI-CLAD SINGLE-PHASE CAPACITOR MOTOR ANNOUNCED BY G. E.

A new integral-horsepower capacitor motor for use wherever power supply demands single-phase operation has been announced by General Electric's Small and Medium Motor Divisions.

Of cast iron construction, the motor presents a smooth, streamlined appearance. To minimize over-all dimensions, capacitors are mounted in the base of the motor, and there is no conduit box on the side. The conduit box has been replaced by a built-in terminal board inside the end shield for easier wiring.

The new Tri-Clad capacitor motor is compact and lightweight weighs 15 to 20 per cent less than the old model. It has a totally enclosed built-in starting switch to keep foreign matter from the contacts, and a completely new and tested centrifugal mechanism designed for long, dependable life.

In ratings from ½ to 5 hp, these high torque motors are available in two

(*Please turn to page* 204)

judgment

snap judgment *can pay off . . . but usually it's an expensive luxury. When considering a better looking and more efficient container for your product, we know you'll want to give this SALES STIMULATING subject a long, hard look. Your Chase Salesman is thoroughly qualified to analyze your requirements. He is supported by engineering, design, and research data that can be quickly brought to bear on your specific problem. Why not make it a point to check with him today?*

bags for all industry and agriculture...

- cotton bags of all kinds
- Topmill burlap bags
- paper & Multiwall bags
- Saxolin open mesh bags
- combination bags, liners, and specialties.

CHASE SINCE 1847 BAGS

CHASE BAG CO. GENERAL SALES OFFICES, 307 WEST JACKSON BLVD., CHICAGO 6, ILL.

BOISE • DALLAS • TOLEDO • DENVER • DETROIT • MEMPHIS • BUFFALO • ST. LOUIS • NEW YORK • CLEVELAND • MILWAUKEE
PITTSBURGH • KANSAS CITY • LOS ANGELES • MINNEAPOLIS • GOSHEN, IND. • PHILADELPHIA • NEW ORLEANS • ORLANDO, FLA. • SALT LAKE CITY
OKLAHOMA CITY • PORTLAND, ORE. • REIDSVILLE, N. C. • HARLINGEN, TEXAS • CHAGRIN FALLS, O • HUTCHINSON, KAN. • CROSSETT, ARK • SAN FRANCISCO

GIVES COMPLETE PROTECTION

Give your workers *complete* protection from gasoline, kerosene, vegetable and petroleum oils, greases, and all but the most corrosive acids by equipping them with Sawyer's Lighthouse Brand NEOPRENE* garments. Three years of research and actual, on-the-job testing have proved that Sawyer's protective clothing *is the most effective and economical on the market.*

Available in a complete range of sizes, in black *or* yellow, Sawyer's protective wear is roomy and comfortable . . . and *100% waterproof.* * Reg. T. M. of E. I. DuPont deNemours & Co.

★ ★ ★

. . . AND DON'T MISS SAWYER'S HYCAR PROTECTIVE APRONS!** Another recent addition to Sawyer's Lighthouse Brand line . . . HYCAR** aprons are light and tough, and resist most acids. They need no bulky reinforcements, for the two lightweight styles (ideal for women) have waist-ties only (tapes go under hem for greater strength) — and the heavyweight HYCAR** apron has four tough and tear-proof grommets.

**American Rubber Hycar is a product of B. F. Goodrich Company

Write for catalog.

The H. M. SAWYER & SON CO.

CAMBRIDGE, MASS.

(*Continued from page* 202)

types: Type KCS, capacitor-start, and Type KCR, capacitor-run. According to G-E engineers, these differ only in starting current, not in output characteristics. The Type KCS motor is designed for 115/230 volts, while the Type KCR motor is a single-voltage, 230-volt design.

Dynamically balanced for smoother operation, the motor features the famous Tri-Clad triple protection against physical damage, electrical breakdown, and operating wear and tear. Being a capacitor motor, it has no brushes or commutators to interfere with radio or television reception. Also, capacitor motors are the only single-phase motors with cast winding squirrel-cage rotors which all industry demands for general purpose motors, engineers said.

The motor is equipped with long-life lubricated ball bearings which will run for years without relubrication, but readily accessible grease fittings make possible easy lubrication when it becomes necessary. Additional information on the new G-E Tri-Clad single phase capacitor motor is contained in publication GEA-5401, which is available from the General Electric Company, Schenectady 5, N. Y.

★ ★ ★

PRATT & WHITNEY IMPROVE CARBIDE BUR DESIGN

To provide operators with better control, especially in nose cutting, the relatively new diamond-cut design of Pratt & Whitney Keller carbide burs, trademarked Di-Bur, has been improved by deepening the flutes at specified intervals. These Di-Burs are master ground from accurate forms on special machines to prevent the formation of minute "flats" responsible for producing annoying needle-like slivers from die steels. They are correctly staggered in proper sequence to make fine granular chips harmless to operators' hands. Grinding the flutes in solid blanks from the shank end makes them run true with the shank without the "hop" or "jump" so damaging to carbide. They are made in all regular shapes and sizes, and in fine, standard, and coarse-cutting grades.

(*Please turn to page* 206)

The guy's card said, "BEARING SPECIALIST"

● "So what", I said to myself . . . "So he peddles all kinds of replacement bearings and gimmicks to maintain, install or remove worn-out bearings". I listened to his pitch, dropped his card in my drawer and forgot him. ALMOST! That was Friday morning.

You see, we've got a new product and are rushing production so our dealers can make some money this year. (And ourselves, too!) We're doing pretty well and I'm home sleeping Friday night when the phone rings. TROUBLE! Our largest unit, an automatic we bought after the war, has broken down. We're stopped cold by a worn out bearing that in the rush we decided might last.

● Stuck—but good! Scrambling out of bed and rushing to the plant, I racked my brains on how to cut installation time on a new bearing. Then I thought of that guy, that "BEARING SPECIALIST" and called him fast.

● "Nothing to it", he says. "I'll drop by our place and get that bearing you need and be out to help put it on right now".

● "How do you know it'll fit?", I asked him. "Fit? Why it's a bearing identical to the one now on your machine", he answered. "We always carry all the better known makes of bearings and that's one of them!"

● He showed up in an hour or so with the bearing and soon everything went back to normal. The plant went back into production. I went back to bed. And the "BEARING SPECIALIST" went back to wherever good guys go until you need them again.

Moral for Plant Superintendents, Foremen and Purchasing Agents:

If you want to sleep nights—make sure your maintenance men know your "BEARING **SERVICE** SPECIALIST"!

"INSTALLATION, MAINTENANCE, REMOVAL of ANTI-FRICTION BEARINGS"

This 20-page booklet tells you the how and why of caring for all types of bearings. Practical ideas on all phases of bearing life. Ask for it now!

A word about the ANTI-FRICTION BEARING DISTRIBUTORS' ASSOCIATION

A group of BEARING SPECIALISTS, working with and for, every segment of industrial America—maintaining the highest standards of business ethics and occupying a place of esteem in industry for the services they render — banded together to further increase their usefulness to industry.

THE ANTI-FRICTION BEARING DISTRIBUTORS' ASSOCIATION

1900 Euclid Avenue • Cleveland 15, Ohio

ACCURATE PIPE CUTS
Quick and Easy

"Anybody does better work with better tools—If they come any better than RIDGID I've never seen 'em."
RIDGID
No 2 HEAVY DUTY
1/8 TO 2

RIDGID Cutters roll right through all kinds of pipe and conduit

● It's really a cinch to cut pipe extra fast with the popular efficiency-balanced RIDGID cutter. Thin heat-treated tool-steel blade leaves practically no burr. Every cutter factory-tested to make sure it tracks perfectly. Your choice of five sizes to 6" pipe; four-wheel cutters to 4." Choose the favorite of men who know fine tools—buy RIDGID cutters at your Supply House.

RIDGID
WORK-SAVER PIPE TOOLS
THE RIDGE TOOL CO. • ELYRIA, OHIO

BENDING MACHINE FOR LOW-COST BENDING OF WOOD PANELS

A bending machine which forms wood panels into an amazing variety of curved shapes has been introduced by the Midwest Manufacturing Co., 41 No. LaClede Road, St. Louis, Mo. It operates on a new principle that makes wood bending easy, accurate and automatic.

Variety of bends made on Landon bending machine

The machine bends plywood, hardboard—such as Masonite, tekwood, veneer, chipboard, wallboard, hard fibre, cardboard and metal-fibre board laminates. The possible range of designs is almost unlimited, including reverse, "S" shaped and close double bends. For example, ¼" plywood can be bent to a 1½" radius, ⅛" plywood to a 5/8" radius.

The Landon bending machines are available in three sizes—48", 72" and 98", depending on the length of bend required. The 96" machine will produce bends up to 96". The company can also supply mandrels in diameters from 1¼" to 12". Changing the machine from one size mandrel to another is said to require but a few minutes.

WOOD BOX PRINTING MACHINE CUTS COSTS

The accompanying illustration shows wood box printing machine used by The American Cyanamid Company in its New Castle, Pa. plant, for marking supplementary information on wood boxes. The marking was formerly done by hand with rubber stamps and stencils. Use of the machine is said to have resulted in better markings and labor savings. The wood box marker, which is made by Industrial Marking Equipment Co., Inc., 7 East 48th St., New York, N. Y. automatically prints on the boxes as fast as they can be pushed through the machine. The machine uses interchangeable rubber type, has self-inking reservoir, and will handle various sizes of wood boxes adaptable to the conveyor line.

(*Please turn to page* 208)

CALL YOUR SPANG CW DISTRIBUTOR WHEN THEY WANT...

JUNE SIDEWALKS IN JANUARY

●Safety and convenience are the reasons why building owners want June sidewalks in January. Dependable performance is the reason why contractors use Spang CW Pipe in snow melting systems. That's because Spang CW is a proved material in closed, hot water heating systems.

Spang CW Pipe can be used with equal effectiveness under either concrete or asphalt. And you'll find that no kid glove care is required to make strong, leak-proof welded joints. What's more, Spang CW is a glutton for punishment. It can be bumped hard, stepped on or run over with a loaded wheelbarrow without being crushed, broken or harmed in any way.

There are other advantages for both you and your customers when you use Spang CW Pipe in any piping job. And there are advantages in doing business with your friendly Spang CW Distributor. Next time you need pipe or piping materials, call him. You'll see what we mean.

SPANG-CHALFANT

Division of The National Supply Company

GENERAL SALES OFFICES: PITTSBURGH, PA.

District Sales Offices: Atlanta; Boston; Chicago; Detroit; Houston; Los Angeles; New York; Philadelphia; Pittsburgh; St. Louis; San Francisco

SPANG
CW

QUALITY *that is recognized wherever pipe is used*

Tufts hand stitched into block cannot become loose.

Handle is easily adjustable to height of sweeper.

Steel bolt in handle prevents thread wear.

Long tufts give longer wear.

See Why

Speed Sweep

Is American Industry's No.1 Sweeping Tool

The brush with the steel back

Steel back prevents splitting and chipping of block.

Tuft arrangement in narrow block provides "spring and snap."

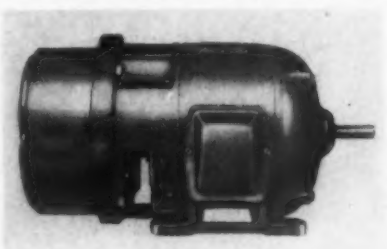
MD

MILWAUKEE DUSTLESS BRUSH CO.

530 N. 22nd Street • Milwaukee 3, Wis.

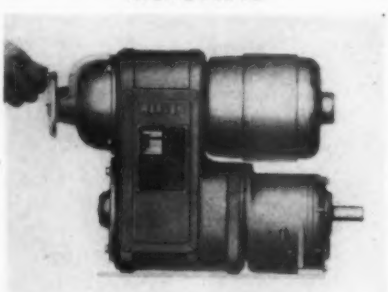
CROCKER-WHEELER ANNOUNCE NEW BRAKE MOTOR AND BRAKE

New brake motor and brake announced by the Crocker-Wheeler Electric Manufacturing Co., Ampere, N. J., offers compactness, simplicity of design, and complete dependability for applications requiring frequent instantaneous stopping and starting. Outstanding features are prelubricated-for-life cartridge bearings and a new brake lining that eliminates the need of adjustments, making the unit



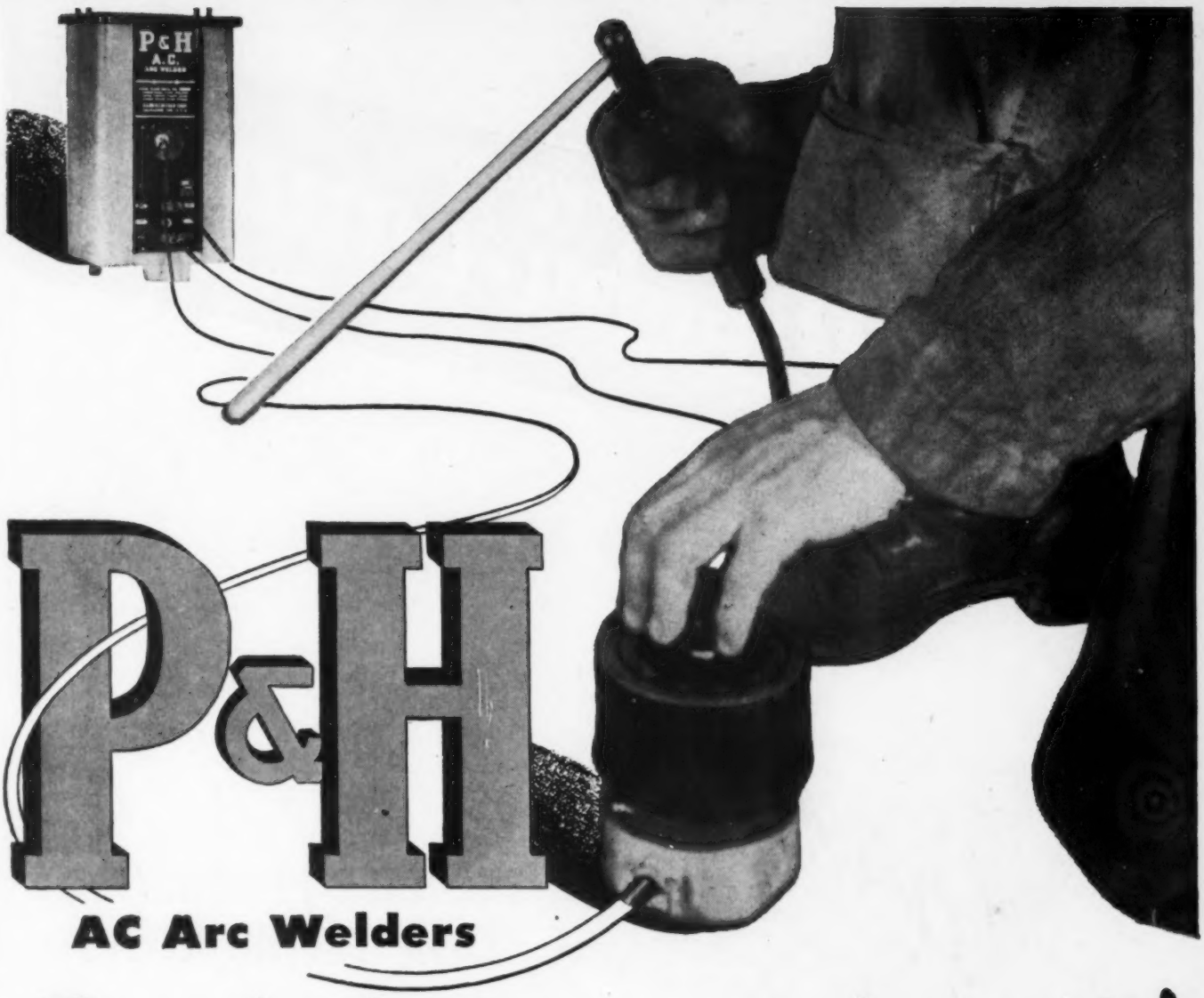
ideal for use in accessible locations. The heart of the new unit is the newly developed brake which can be mounted on dripproof, slashproof, or totally enclosed motors to make a matched brakemotor in ratings from 1-60 hp. One of the outstanding advantages of the new brake is the use of bonded metal brake linings. These linings, it is said, are not affected by heat, cold, dampness, salt water, fungi, grease or oil. The all-metal construction of the brake discs provides greater wear resistance, eliminating adjustments and replacements for all normal applications. The motor is available separately for mounting on NEMA standard D flange motors in frames 203-326 or C face motors in frames 364-405 with standard double shaft extensions.

NEW REEVES FRACTIONAL HP MOTODRIVE



A smaller and more compact version of the Reeves Motodrive in fractional horsepower sizes is announced by the Reeves Pulley Co., Columbus, Indiana. The new units combine motor, speed varying mechanism and reduction gears in one package. The horsepower sizes are ¼, 1/3, ½ and ¾. Ratios of stepless speed variation within 10:1 are available for each size.

Designated as the "1000 Series", the new units are as small in height as 9⅝" in horizontal position and 16⅞" in vertical position. A total of 24 different assembly combinations for vertical or horizontal floor mounting or horizontal wall mounting are available for each horsepower rating. Bulletin M-4917 describes the new Motodrives in detail.



P&H

AC Arc Welders

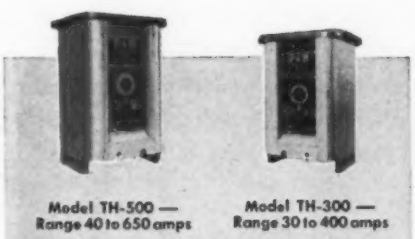
Turn the heat on – at the work!

Exclusive Dial-lectric control saves time and motion, cuts your welding costs

P&H built-in remote control puts heat selection just where your operators want it — at the work. Walking time is turned into welding time. Mount the welder on the wall—save valuable floor space. Welding is faster, sounder, better looking. Production goes up, costs go down.

Additional features are: Easy quick-start arc. Elimination of arc blow. No moving parts to cause delays or maintenance expense. High electrical efficiency that reduces power costs. NEMA rated.

See your P&H representative or distributor for full details.



Model TH-500 — Range 40 to 650 amps

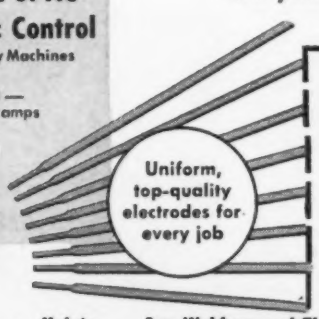
Model TH-300 — Range 30 to 400 amps

The only Complete Line of AC Welders with Dial-lectric Control

Also complete line of High-Frequency Machines

Model TI-200 — Range 30 to 275 amps

Model TI-150 — Range 20 to 190 amps



TEAR OUT THIS COUPON AND MAIL TODAY

P&H WELDING DIVISION
4577 W. National Ave.
Milwaukee 14, Wisconsin

HARNISCHFEGER CORPORATION
MILWAUKEE, WISCONSIN, U. S. A.

Please send me additional information showing how P&H AC welders cut welding costs.

Name.....

Company..... Title.....

Address..... ☐ Home ☐ Business

City..... (...) State.....

Excavators • Overhead Cranes • Hoists • Arc Welders and Electrodes • Soil Stabilizer • Crawler and Truck Cranes • Diesel Engines Cane Loaders • Pre-assembled Homes

Want Additional Product Information? See Page 19.

THE NEW REMINGTON Electri-conomy TYPEWRITER

to INCREASE PRODUCTION— SLASH TYPING COSTS! for INSURANCE COMPANIES

Here's exciting news on how you can increase your typing production! Yes, anywhere from 10% to 50% is possible with the new Remington Electri-conomy—the new electric typewriter that turns out *more* work, *better* work in *less* time and with *less* effort. The Electri-conomy is scientifically designed to meet all your typing requirements with greater ease, greater speed and greater accuracy. Mail the coupon below for detailed information on how *you* can start saving today . . . the Remington Electri-conomy way!

Copyright 1950 by Remington Rand Inc.

Make the Electri-conomy test in your office today!

Remington Rand, Dept. TE-32, 315 Fourth Ave., N. Y. 10

☐ Please send me a FREE copy of "Electric Typing vs. Manual Typing."

☐ Please have your representative call to perform the *free* Electri-conomy Test in my office — without obligation, of course.

Name.....

Company.....

Address.....

City .....Zone....State.....

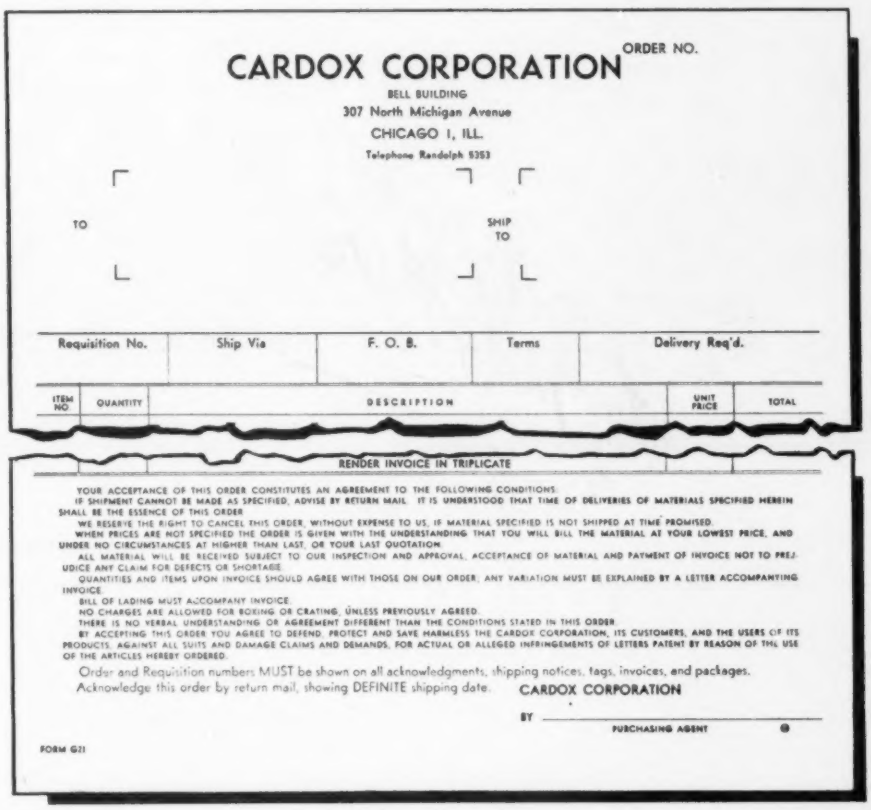
Remington Rand
THE FIRST NAME IN TYPEWRITERS

PRODUCTION EXECUTIVE

Office Equipment and Supplies

Three New Forms Presented in the Forum

The accompanying forms were furnished by Milton Heman, Purchasing Agent, Cardox Corporation, Chicago. They include "Cost & Sales Price Change Notice", "Weekly Commitment Record", and "Estimated Billing" Report.



CARDOX CORPORATION

ORDER NO.

BELL BUILDING
307 North Michigan Avenue
CHICAGO 1, ILL.
Telephone Randolph 9353

TO

SHIP TO

Requisition No.	Ship Via	F. O. B.	Terms	Delivery Req'd.

ITEM NO.	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL

RENDER INVOICE IN TRIPLICATE

YOUR ACCEPTANCE OF THIS ORDER CONSTITUTES AN AGREEMENT TO THE FOLLOWING CONDITIONS.
IF SHIPMENT CANNOT BE MADE AS SPECIFIED, ADVISE BY RETURN MAIL. IT IS UNDERSTOOD THAT TIME OF DELIVERIES OF MATERIALS SPECIFIED HEREIN SHALL BE THE ESSENCE OF THIS ORDER.
WE RESERVE THE RIGHT TO CANCEL THIS ORDER, WITHOUT EXPENSE TO US, IF MATERIAL SPECIFIED IS NOT SHIPPED AT TIME PROMISED.
WHEN PRICES ARE NOT SPECIFIED THE ORDER IS GIVEN WITH THE UNDERSTANDING THAT YOU WILL BILL THE MATERIAL AT YOUR LOWEST PRICE, AND UNDER NO CIRCUMSTANCES AT HIGHER THAN LAST, OR YOUR LAST QUOTATION.
ALL MATERIAL WILL BE RECEIVED SUBJECT TO OUR INSPECTION AND APPROVAL. ACCEPTANCE OF MATERIAL AND PAYMENT OF INVOICE NOT TO PREJUDICE ANY CLAIM FOR DEFECTS OR SHORTAGE.
QUANTITIES AND ITEMS UPON INVOICE SHOULD AGREE WITH THOSE ON OUR ORDER; ANY VARIATION MUST BE EXPLAINED BY A LETTER ACCOMPANYING INVOICE.
BILL OF LADING MUST ACCOMPANY INVOICE.
NO CHARGES ARE ALLOWED FOR BOXING OR CRATING, UNLESS PREVIOUSLY AGREED.
THERE IS NO VERBAL UNDERSTANDING OR AGREEMENT DIFFERENT THAN THE CONDITIONS STATED IN THIS ORDER.
BY ACCEPTING THIS ORDER YOU AGREE TO DEFEND, PROTECT AND SAVE HARMLESS THE CARDOX CORPORATION, ITS CUSTOMERS, AND THE USERS OF ITS PRODUCTS, AGAINST ALL SUITS AND DAMAGE CLAIMS AND DEMANDS, FOR ACTUAL OR ALLEGED INFRINGEMENTS OF LETTERS PATENT BY REASON OF THE USE OF THE ARTICLES HEREBY ORDERED.

Order and Requisition numbers MUST be shown on all acknowledgments, shipping notices, tags, invoices, and packages.
Acknowledge this order by return mail, showing DEFINITE shipping date.

CARDOX CORPORATION

BY _____
PURCHASING AGENT

FORM G21

The Purchase Order form is printed on lettersize sheet. Among other things, the conditions provide: "When prices are not specified the order is given with the understanding that you will bill the material at your lowest price, and under no circumstances at higher than last, or your last quotation."

RENDER INVOICE IN TRIPLICATE

IMPERATIVE

THIS FORM TO BE COMPLETED AND RETURNED WITHIN THREE (3) DAYS AFTER RECEIPT OF ORDER

DATE _____

To: CARDOX CORPORATION, Chicago 1, Illinois

This Purchase Order is hereby accepted and shipment will be made as requested unless otherwise specified.

SIGNED _____

BY _____

This is lower section of the acknowledgment copy of the Purchase Order. It is printed in red, and under the word "Imperative" states: "This form to be completed and returned within three (3) days after receipt of order."

(Please turn to page 212)

(Continued from page 211)

CARDOX CORPORATION

COST & SALES PRICE CHANGE NOTICE

Purchasing Dept. No. _____

Date _____

By _____

ITEM:

COST DATA

Current Cost _____

Revised Cost _____

Date Effective _____

COMMENTS

SALES DATA

Current Price _____

Revised Price _____

Date Effective _____

APPROVED BY _____

By _____

Date _____

Sales Bulletin

Issued By _____

Date _____

Right: "Cost and Sales Price Notice" issued by the Purchasing Department.

●

Below: "Weekly Commitment Record".

These two forms and the one below are Hectograph forms.

PURCHASING DEPARTMENT

WEEKLY COMMITMENT RECORD

WEEK ENDING _____

	Commitments Outstanding Beg. of Week	New Commitments During Week	Billing Received During Week	Cancellations During Week	Commitments Outstanding End of Week
AIRDOX F. A.					
OTHER F. A.					
TANK PROGRAM					
MINING CARTRIDGES					
HARDSOCG RESALE					
Miscellaneous (Including Resale Items Except Hardsocg)					
TOTAL					

Date _____

By _____

PURCHASING DEPARTMENT

ESTIMATED BILLING

DATE _____

MONTH	AIRDOX F.A.	OTHER F.A.	TANKS	MINING CARTRIDGES	HARDSOCG RESALE	MISC. INCLUDING RESALE ITEMS	TOTAL

BY _____

"Estimated Billing" form used by Purchasing Department.

(Please turn to page 214)

It's Easy to SEE

. . . why everyone likes to work with National Ring Visible Records!

National's Ring Visible provides instant visibility for speed in posting or reference, plus edge-flagging of key facts. Here's a record system you'll use profitably in every department in your business.

National Ring Visible sheets are available in two capacities and eight sizes for every Visible Record need. And you can have your choice of National's famous cool-green EYE-EASE* or Buff . . . both in high rag content ledger stock, substance 24.

See for yourself . . . get your copy of National's Business and Accounting Records Catalog . . . detailing and illustrating a complete, single-source line of stock forms and housings for record-keeping use . . . see your National Stationer. Or write direct for your Catalog, $1.00 per copy.

National Blank Book Company

New York Boston Holyoke, Mass. Chicago San Francisco

NATIONAL

*T. M. Reg. U. S. Pat. Off.

(Continued from page 212)

Now... Intense Color with a feather touch

No other office colored pencil ever combined *all* the features of the new

EBERHARD FABER

Colorbrite

EXTRA THIN

Only Colored Pencils made with new COLIMAC* formula... New, scientific color hues for high visibility. Easier to read in any light... AMAZINGLY STRONG leads, GUARANTEED not to break in normal use... Wet-proof, smear-proof, permanent!... Write fast, bear down hard... you'll hail Colorbrite's smoothness, color and strength. *It's different!*

Attach coupon to your business letterhead for FREE SAMPLE

Mail to Eberhard Faber Pencil Company, Dept. P-2 37 Greenpoint Avenue, Brooklyn 22, N. Y

Name_____

Position_____

Dealer's name_____

Color choice: ☐ red ☐ green ☐ blue ☐ yellow

*The name Eberhard Faber has given its new Colorbrite lead formula

TRADE MARKS REG. U. S. PAT. OFF.

CARDOX CORPORATION
MATERIAL REQUISITION

TO PURCHASING DEPT.

DATE
REQ. NO.
SHIP VIA
F.O.B.
DELIVERY REQ'D.
CHARGE TO:
JOB No.
STOCK
MAINTENANCE
NICKEL SHOP
OTHER
PURCHASING DEPT. DISTRIBUTION
ESTIMATED EXPENDITURE
P.O. NUMBER
APPROVED

Quantity	Cardox Stock No.	Complete Description	Stock on Hand	Average Monthly Use

SHIP TO:

Recommended Source of Supply

Prepare this form in duplicate.
Retain one copy for reference
Use a Separate Sheet for Each Kind of Goods
Form C6 Rev. SSC 11 5-48—5M

Signed _____ For Dept.

The Material Requisition provides for a complete record.

RENDER INVOICE IN TRIPLICATE

DATE OF SHIPMENT	INVOICE RECEIVED	PARTIAL	COMPLETE	DELIVERY INFORMATION			
				DATE	INDIVIDUAL CONTACTED	DELIVERY PROMISE	REMARKS

CARDOX CORPORATION

BY _____
PURCHASING AGENT

PURCHASING FILE COPY

Record section on Purchasing and Plant copies of Purchase Order.

NO. DESCRIPTION DEPTS. USING MAX. MIN.

SUPPLIER	STREET ADDRESS	TOWN — STATE	TEL. NO.	SALESMAN

DATE	FROM NO.	ORDER NO.	QUANTITY	DATE INVOICE	GROSS PRICE AMOUNT	GROSS PRICE UNIT	TRADE DISCOUNT	F. O. B.	TERMS	DATE REC'D	CHARGE ACCOUNT	REMARKS

M-18 - 2M Wm. McWhorter

Cardox Corporation's Purchase Record Form (8" x 5").

bring your layouts to life: print on

INTERNATIONAL *Ticonderoga Text*

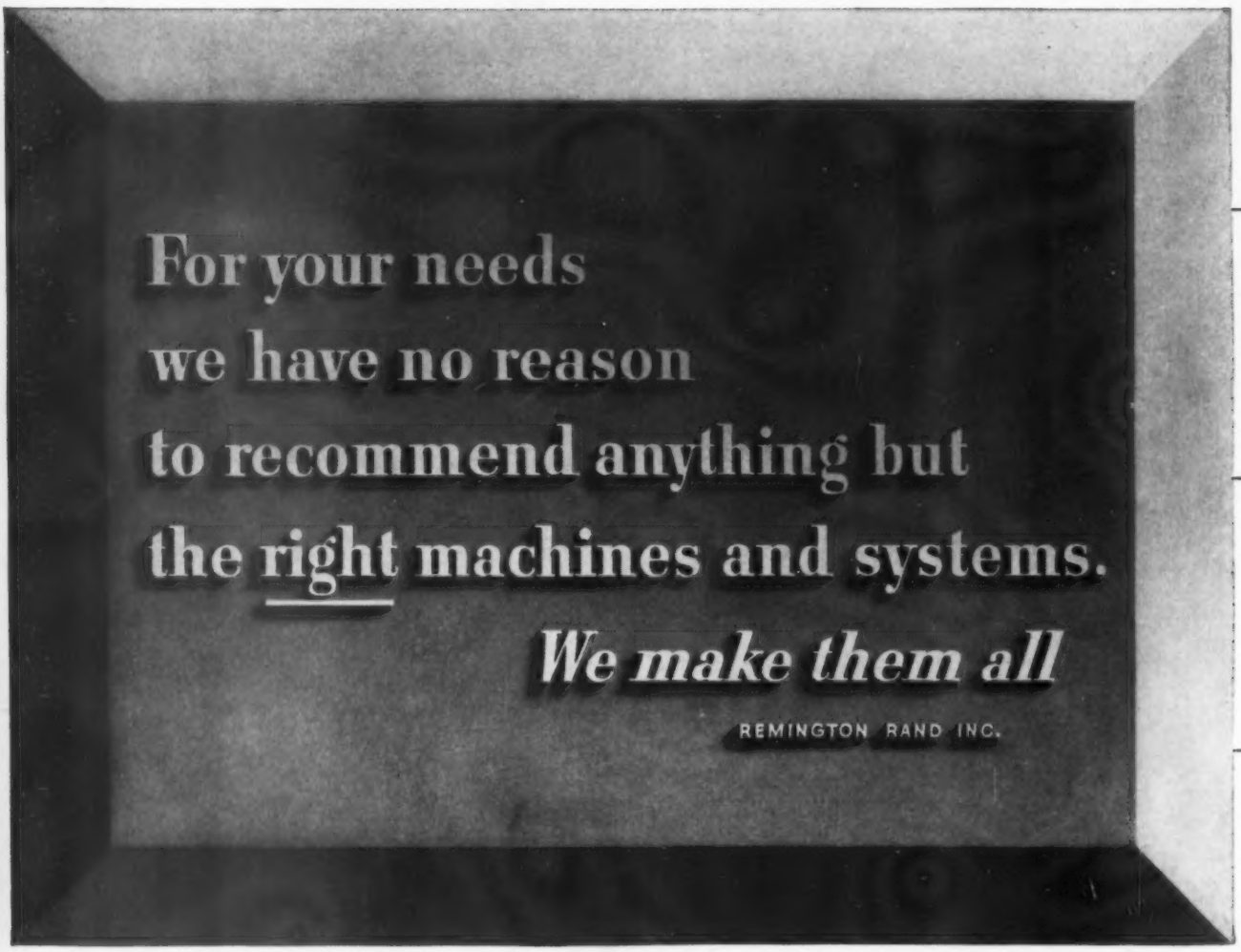
Good eye-appeal, good all the way through! That's watermarked **Ticonderoga Text**—combining distinctive appearance with top performance and surprisingly low cost. Use with letterpress, offset, gravure. Specify for book jackets, brochures, programs, announcements, your finest printed matter. In 7 colors plus cream and brite white; laid and wove, envelopes to match, plain and deckle-edged. Where the job calls for it—team it up with **Ticonderoga Coverweight** in matching colors!

International Paper Company, 220 East 42nd Street, New York 17, N.Y.

INTERNATIONAL PAPERS

for Printing and Converting

Want Additional Product Information? See Page 19.



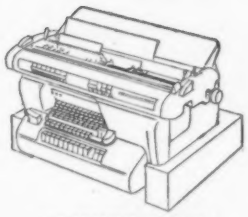
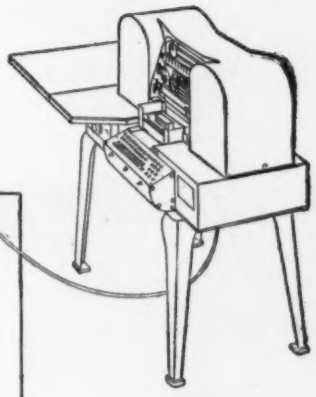
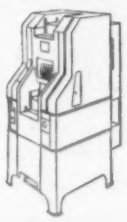
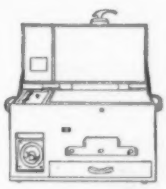
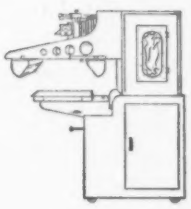
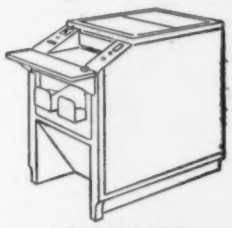
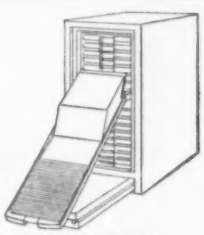
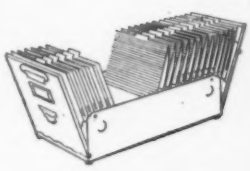
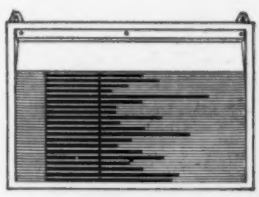
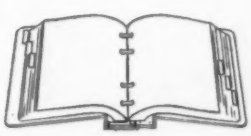
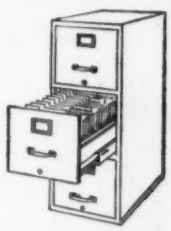
When it comes to your business . . .

Remington Rand, with its more-than-twenty thousand business products, has 20,000 tools to help you save money. For we have found that most "overhead" costs can be reduced . . . by examining time-worn methods . . . planning new procedures . . . integrating systems and equipment. And we can implement our recommendations by actually installing the equipment suggested, even training your personnel to use it.

If you would like to talk to one of our representatives about cost-cutting on a strictly "prove it to me" basis, please phone your local Remington Rand office. There is no obligation, of course.

Copyright 1950 by Remington Rand Inc.

Want Additional Product Information? See Page 19.

ACCOUNTING MACHINES	 FOREMOST "685"	BILLING MACHINE	 SYNCHRO-MATIC PUNCH
PUNCHED-CARD METHODS	TABULATOR	 COLLATING REPRODUCER	
RECORD PHOTOGRAPHY	 PORTAGRAPH	 DEXIGRAPH	 FILM-A-RECORD
VISIBLE SYSTEMS	 KARDEX	 KOLECT-A-MATIC	 SCHED-U-GRAPH
TYPEWRITERS & CALCULATORS	ELECTRIC	NOISELESS	PRINTING CALCULATOR
ANY OTHER OFFICE NEED	ADDING MACHINES	 CATALOG BINDERS	 SAFE-FILES

Remington Rand 315 FOURTH AVE., NEW YORK 10, NEW YORK
SALES AND SERVICE OFFICES IN PRINCIPAL CITIES OF THE WORLD

A FEATHER
in Any P.A.'s Cap!

SEA FOAM BOND

America's Favorite
Lightweight
Business Paper

- **STANDARDIZES OFFICE FORMS**
  Keeps your entire record and communication system uniformly businesslike.
- **SAVES MONEY 2 WAYS**
  Sea Foam's *lightness* cuts down postage. Sea Foam's *thinness* means extra sheets per pound.
- **MAKES 14 CLEAR CARBONS WITH YOUR TYPEWRITER**
  Cuts copying time with pen, pencil or typewriter. So thin it saves valuable file space. Yet it's strong to stand up in files.
- **7 EFFICIENT ROUTING COLORS**
  Sea Foam comes in white or bright colors to facilitate fast, accurate routing.

Sea Foam's FREE Test Kit
Can Help You Rate Another Feather! Write on your Company Letterhead.

BROWNVILLE PAPER COMPANY
The Mill of Fine Lightweight Papers
17 Bridge St. Brownville, N. Y.

DITTO ANNOUNCES NEW SYSTEMS DUPLICATOR

Fast, flexible systems duplicator known as Ditto D-45 machine, is announced by Ditto, Inc., Harrison Street at Oakley Boulevard, Chicago, Ill. In addition it is a heavy duty general office duplicator for any duplicating job whether typed, handwritten or drawn—four colors at once are reproduced, 100 copies a minute, 300 to 500 per master. New type clutch makes for barely audible operation. Other features include a dial controlled margin adjustment for instant, accurate register in small spaces on forms, even when the master does not register with the copy sheets; a master clamp on the drum of the machine, foot pedal operated, leaving operator's hands free for handling masters; and an optional line printing tray which automatically adjusts for copying each line on a master. The machine copies on any card or paper from small labels to 14" x 15¼".

T. R. RUDEL ELECTED PRESIDENT OF EBERHARD FABER PENCIL CO.

Thomas R. Rudel

Thomas R. Rudel was recently elected president of the Eberhard Faber Pencil Co., Brooklyn, N. Y. Mr. Rudel joined the company in May of 1932 as an assistant to the late Eberhard Faber. Louis M. Brown was again named executive vice president of the company, and A. J. Farber was appointed secretary-treasurer.

BOOKLET ON PRODUCTION PLANNING AND OFFICE OPERATIONS CONTROL

How to get speed, quality and economy in large-scale office production is spelled out in an 80-page booklet on *Production Planning and Control in Office Operations,* issued by the Bureau of the Budget.

Published for the use of Federal agencies in connection with the President's government-wide management improvement program, the new management bulletin is also being made available to private business firms and the general public.

In announcing the publication, Frank Pace, Jr., Director of the Bureau of the Budget, stated that "under a continuing responsibility to help Federal agencies improve management practices in the interest of better government at lower cost," the Bureau of the Budget had attempted "to bring together and organize the essential know-how accumulated by both government agencies and business firms which have achieved notable results from the application of production planning and control to office operations."

Mr. Pace pointed out that "much the same general approach that has resulted in greater output at less cost in manufacturing operations can be applied to advantage in large-scale office operations and other non-manufacturing enterprises, including a large part of the work done by government agencies."

Many executives from business and industry have participated in the development of the booklet and have expressed the view that it will be just as useful to management people outside the government as to those in it, Mr. Pace said.

The bulletin covers problems of organization, workflow, scheduling and control at the operating level, and is intended mainly for management staff people who specialize in the solution of such problems. It may be obtained for 35 cents from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

H. C. DAVIES ELECTED TO McBEE BOARD OF DIRECTORS

H. C. Davis, vice president in charge of sales of The McBee Company, manufacturers of special accounting devices and forms, was elected to the board of directors at annual stockholders meeting held in the general offices of the company at Athens, Georgia. General sales headquarters are located in New York City.

L C SMITH & CORONA ACQUIRES LLORENS ADDING MACHINE

The L C Smith & Corona Typewriters Inc. has completed arrangements with the Universal Business Machine Corporation for the purchase of the Llorens adding machine. The product will be manufactured and marketed under the name "Smith-Corona" during the last half of 1950. The Llorens is a ten key machine.

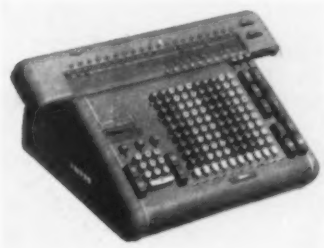
STEEL DESK CATALOG

New booklet, FF-115 has been issued by Remington Rand Inc., 315 Fourth Avenue, New York, N. Y., describing the company's line of "Foremost" steel desks. Pointing out that the line "embodies a new concept of the desk as an efficient tool for business," the 20-page illustrated booklet describes its various revolutionary departures in design from standpoints of appearance and usefulness, and includes a detailed list of specifications for the desks. One of the salient features of the line is the use of interchangeable pedestal and tops, permitting a wide choice of desk assemblies to suit different office needs. Another, ac-

cording to the booklet, is the elimination of waste space that has been achieved by smaller, more functional sizing, and permits the comfortable use of four of the desks in a space ordinarily used by three.

FRIDEN OFFERS FULLY AUTOMATIC CALCULATOR

A new fully automatic calculator is being marketed by the Friden Calculating Machine Co., Inc., San Leandro, Calif. Possessing a score of new features, the new calculator is credited with eliminating operator effort and fatigue. It offers complete fully automatic multiplication,



Friden's new "ultra-matic" calculator

division, addition and subtraction. All figure-work problems are handled, from elementary to the most complicated, with simplicity and ease, and sustained, accurate high speed. This new "ultra-matic", says the company, permits the operator to write the answer to one problem while the next is being automatically computed.

ALUMINUM CLIPBOARDS

Satin-finished aluminum clipboards in legal, letter, note and pad sizes are being marketed by Metal Products Engineering Inc., Los Angeles 11, Calif. The boards are available with narrow or wide clips which hold paper or pad securely. All sizes embody a squaring tab feature for maintaining alignment of material under the clip. The boards are light in weight, easy to clean, and are designed for a lifetime of service.

(*Please turn to page* 220)

WHY DO WEBSTER DUPLICATING SUPPLIES ACTUALLY COST LESS?

Because they last longer and give better service

P.A.'s always get more for their duplicating dollars when they buy Webster supplies. These high quality products assure you of dependable service day after day after day. That's the big reason why leading offices for 61 years have consistently bought the Webster brand.

EXTRA WEAR MEANS *EXTRA* VALUE IN EVERY WEBSTER PRODUCT

1. Webster's Tabulating Ribbons . . . made with high grade, woven edge cloth, properly inked for each type of machine to *guarantee longer wear.*

2. Webster's Micrometric Carbon Paper . . . with its exclusive numbered edge eliminates retyping for spacing errors. Gives clear, sharp impressions even after *continuous hard usage.*

3. Webster's Pencil Carbon . . . *gives 100 impressions* which last as long as the paper on which they are written.

4. Webster's MultiKopy Typewriter Ribbons . . . have to be changed only half as often as standard ribbons. Made in extra lengths with special ink formulas for every typewriter.

Next time you need long lasting duplicating supplies of dependable quality, order Webster's. Consult your nearest dealer or write to F. S. Webster, 7 Amherst St., Cambridge, Mass.

F. S. WEBSTER COMPANY

Webster's warehouses in key cities from coast to coast:
New York, Philadelphia, Pittsburgh, Detroit, Chicago, San Francisco, Cambridge

DIV-I-DEX Drop-in Method guarantees you an extra file drawer in every four drawer file cabinet by utilizing the 'dead' space. Adoption of DIV-I-DEX adds 72 square inches to every file drawer.

Progressive filing is simplified because when a DIV-I-DEX compartment becomes full, the overflow can be easily slipped into the next empty.

DIV-I-DEX not only saves file space but also streamlines sagging, slumping folders into an efficient, compact, accessible file unit.

GAIN FILE SPACE AND SAVE FLOOR SPACE

CEL-U-DEX

Brooklyn, N. Y.

G. E. WILLIAMSON ELECTED PRESIDENT AND BOARD CHAIRMAN STRATHMORE PAPER

G. E. Williamson was reelected president and chairman of the board, Strathmore Paper Co., West Springfield, Mass., at recent annual meeting. Vice presidents reelected are C. M. Bryan, A. E. Shattuck, F. N. Bridgham and H. E. Riggs. Mr. Bridgham was reelected treasurer.

In his report to the stockholders, Mr. Williamson stated the fiscal year ending October 31, 1949, had been a good one, in fact somewhat better than the previous year. Although there are many intangibles in the offing—possible international complications, adverse political action, strikes, exorbitant and possibly unbalanced state and Federal budgets, increased taxes, socialistic trends and many others—which may cause a lack of confidence and a slump in business, Mr. Williamson believes the favorable factors over-balance the unfavorable ones, and that a continuation of good business is assured for 1950, at least for the first half of the year.

During the year, more than $600,000 was spent on plant improvements and maintenance in an endeavor to keep abreast of the times.

NEW MODEL DICTATING MACHINE ANNOUNCED BY SOUNDSCRIBER

New style recorder and transcriber units constituting the Soundscriber dictation system, are announced by the Sound Scriber Corporation, New York, N. Y., who stress the interchangeability of the new equipment with existing equipment.

Logging slips or strips are unnecessary, as the "television" indexing indicates end of letters or corrections.

The previously employed wooden cabinet has been replaced by a diecasting of airplane metals, though they are more compact and occupy little more space on the desk than a business letterhead. One of the new features of the new recorder is a hand microphone which enables the executive, by simply pressing a switch, to listen back to the last few words of his dictation without manipulating the recording instrument—it's all done in the microphone itself.

A unique feature of the transcriber is an optical screen which reflects the surface of the disc onto a screen. Since indexing is done automatically, the operator is able by looking at the screen to read end-of-letter and correction indications. This "television indexing transcriber", as it is called, illuminates and magnifies the disc surface with the indexing instructions on it and projects it against a scale which is calibrated from 0 to 15.

PROFESSIONAL FILE CABINET

"The Professional File" is name of new office cabinet 34½" wide, 37½" high, and 17½" deep, recently introduced by the Cole Steel Company, 285 Madison Avenue, New York. The cabinet includes two legal files with spring compressors, that glide on ball bearing rollers; two drawers having 3200 5 x 8" card capacity; two drawers 16" x 17½" x 1¾"; and a storage compartment with two adjustable shelves fitted with lock and key. The file is constructed of heavy gauge steel, and is available in green or gray finish. It may be had with locks on both legal size drawers.

EDISON NAMES ATLANTA DISTRICT MANAGER

The appointment of George Arnold Stark as Atlanta District Manager of Thomas A. Edison, Incorporated, Ediphone Division, is announced by James B. Young, regional manager of the Southeastern District. Mr. Stark has been with the company since March, 1949. He is a native of Dalton, and a graduate of the University of Georgia.

NEW MACHINE FOR MAKING AMMONIA VAPOR WHITE PRINTS

New whiteprinting equipment called the Pease Pacemaker, a completely automatic machine designed for printing and developing ammonia vapor white prints continuously, in cut sheets or from rolls at speeds ranging up to 32 feet per minute, has been put on the market by the C. F. Pease Company of Chicago. It reproduces anything typed, written or drawn on reasonably translucent paper. It will accommodate all types and sizes of diazo materials up to 42 inches wide. The few controls necessary are within easy reach of the operator, and automatic signal lights are provided to indicate various conditions in the func-

tioning of the machine during its operation. A push button master switch controls all electric motors and heaters, instantaneously starting or stopping the entire mechanism. A new type of interlocking roller developer makes it possible to develop all types of diazo materials without sticking, scratching or wrinkling, and the assembly keeps the prints completely exposed to ammonia vapors to insure a complete and full development even at maximum production speeds. A conveniently located speed control lever gives the operator immediate and positive control. The amount of ammonia that enters the developer is controlled and governed automatically by the feed rate selected by the operator.

The pacemaker operates on wiring of 200 to 250 volts, 60 cycle single phase a.c. with a starting current of 32 amperes and running current of 48 amperes or a kilowatt load of 9.6. The net weight of the machine is approximately 2500 lbs. The extreme width is 7′ 6″ and height is 7 feet.

PORTABLE ADDRESSER HAS CAPACITY FOR 250 ADDRESSES

Portable fool-proof spirit addresser, made by the Heyer Corporation, 1850 So. Kostner Ave., Chicago, Ill., has capacity for about 250 addresses on a master spirit roll and loads and handles like a camera. Fluid is stored in an easy to fill cartridge wick which stays wet for a full run. One smooth motion applies fluid to the envelope or card and prints the address, and each address is good for 100 or more impressions. In addition to addressing, the little machine can be used for printing when up to seven lines of copy must be repeated on forms, tickets, slips, cartons and other objects. Maker states that it will print on almost anything—practically anywhere.

NEW CATALOG ON STEEL DESKS AND TABLES

The Haskell Manufacturing Co., Inc., Dept. E., 207 Penn Ave., Pittsburgh, Pa., announces publication of its new 1949-1950 catalog. The firm manufacturers a complete line of all-steel office desks and tables, and the 12-page illustrated catalog presents typewriter tables, salesmen's desks, shelf and leg-type tables, fixed-bed and overhang desks as well as special mail sorting racks, etc.

(*Please turn to page 222*)

Prominent Users of Strathmore Letterhead Papers: No. 86 of a Series

The assembly line keeps moving. Founded in 1881, the Tappan Stove Company was first to market a range for use with liquefied petroleum gas . . . originated the Tel-U-Set assembly, Divided Top, Visualite Oven and other modern features.

Is your letterhead as up-to-date as your product?

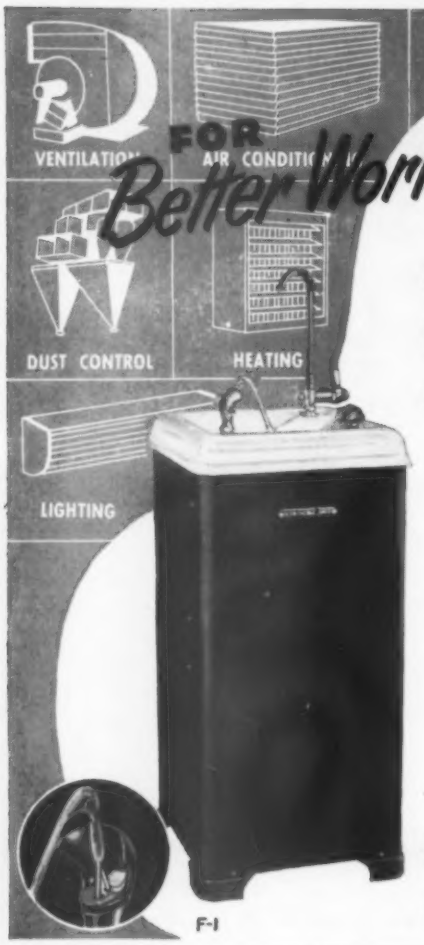
Whatever your product, it is highly important for your letterhead to reflect the alert, progressive character of your firm. The design of the letterhead, the quality of the paper itself can definitely decrease or increase the impact of the message it carries. That is why so many leaders in their fields, such as the Tappan Stove Company of Mansfield, Ohio, choose Strathmore for effective letterhead papers.

It may be time to review your current letterhead. *Is* it really current? Does the design properly interpret your firm in terms of today? How about the paper? Does its surface and texture say to the eye, "This company is alert, a leader"? If not, ask the supplier of your letterheads to submit new designs on Strathmore expressive papers.

Strathmore Letterhead Papers: Strathmore Parchment, Strathmore Script, Thistlemark Bond, Alexandra Brilliant, Bay Path Bond, Strathmore Writing, Strathmore Bond. Envelopes to match converted by the Old Colony Envelope Company, Westfield, Mass.

STRATHMORE *MAKERS OF FINE PAPERS*

Strathmore Paper Company, West Springfield, Massachusetts



FOR *Better Working Conditions*

don't overlook a modern drinking water supply!

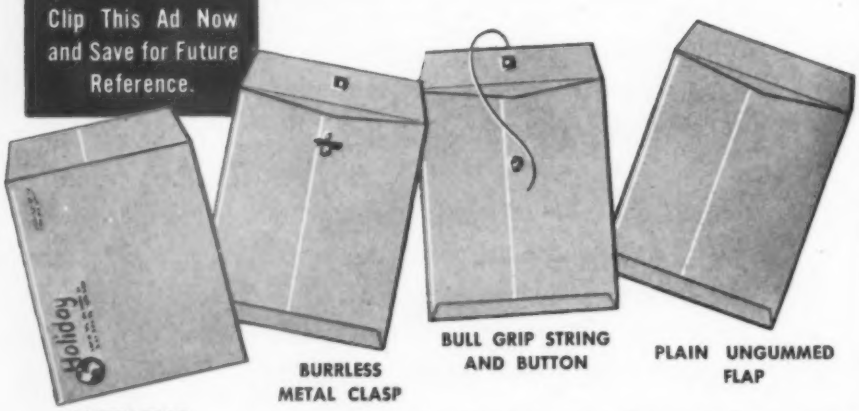
The most modern improvements mean nothing without that most important step . . . assurance of plentiful refreshing cool water for every worker! It's a must in any 1950 modernization program. Specify the favorite of industry . . . Halsey Taylor fountains and coolers.

THE HALSEY W. TAYLOR CO.
WARREN, OHIO

HALSEY TAYLOR
Fountains and Coolers

SAVE!
BUY DIRECT FROM MANUFACTURER
Clip This Ad Now and Save for Future Reference.

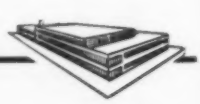
CATALOG ENVELOPES AND MAGAZINE MAILERS



SAFETY-EDGE MAGAZINE MAILER
BURRLESS METAL CLASP
BULL GRIP STRING AND BUTTON
PLAIN UNGUMMED FLAP

Shown are four styles in envelopes and "mailers" designed for improved and lowered handling costs. Equitable makes catalog envelopes to your specifications. Attach ad to one of your present envelopes and tell us your requirements: plain or printed, open end, metal clasp or string and button — we'll submit direct-from-our-own-mill quotations by return mail.

Equitable
PAPER BAG COMPANY
Mills at Orange, Tex.
45-50 VAN DAM STREET
LONG ISLAND CITY 1, N. Y.



DELUXE INDUSTRIAL CHAIR WITH SNAP-ON SEAT CROWN

Suited to every industrial use, from the machine and work bench to the drafting room, new industrial chair, cataloged as deluxe #664 by the Royal Metal Manufacturing Co., 175 North Michigan Ave., Chicago, Ill., features a snap-on seat crown for easy, inexpensive replacement. The cluster leg permits free foot and leg movement, and the chair design allows for seat and back adjustment to every body position, seat taper automatically positioning the body to give full back support. Adjustment of the chair is controlled by three hand wheels. The chair is available in three height ranges, namely, 17″ to 23″, 21″ to 27″, and 26″ to 32″.

Snap-on seat crown simplifies replacement

PLASTIC COATED REPRODUCTION PAPERS AND CLOTHS

Tecnifax Corporation, Holyoke, Mass., manufacturers of diazotype reproduction materials for Ozalid and similar white-print machines, is offering new plastic-surfaced intermediate papers and cloths known as *Tecnilith* and *Technicloth*, in both sepia-line and black-line formulations. This is the first time black-line diazotype intermediates have been offered to the industry.

Tecnilith prints of either color, printed in reverse from the original tracing, are claimed to produce better blue- or black-line prints than those produced from the original tracing, at equally fast speeds. The image will not bleed, nor offset on other prints, nor become brittle or yellow with the passage of time. The plastic surface protects it from dirt, but in the event of some soilage it can be cleaned with a soap eraser or a moistened cloth. The print closely resembles photographic reproduction, and is said to be easily correctible with Tecnifax correction materials.

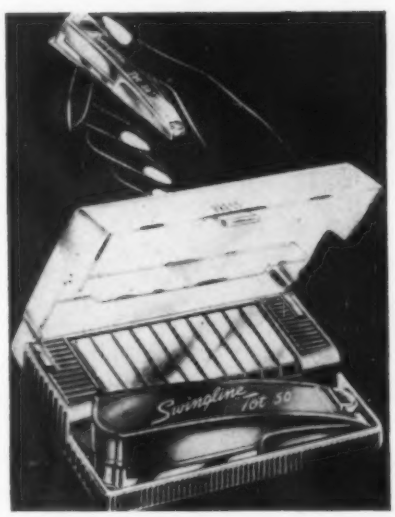
Tecnicloth, like its paper counterpart, is claimed to better the original tracing. The base material is a finely woven tracing cloth, of a high transparency, coated with an intermediate type plastic-sensitized surface.

GFC ANNOUNCES COUNTER AND DESK HIGH SUPER-FILERS

New two- and three-drawer letter and cap sized Super-Filers equipped with self-adjusting divide-a-files and sectional tops and bases, are announced by the General Fireproofing Co., Youngstown, Ohio. Two types of sectional tops are available: a velvoleum top and a steel top. All counter high cabinets have sectional black recessed bases. When centered in the normal position they provide a 1½" toe space at the front and back. They are easily changed to form either a flush back or front, with 3" toe space at the opposite end. Without bases, the counter-high files are 2-11/16" lower and can be placed conveniently under special built-in counters. Sectional bases 1½" high are available for use with desk-high files where the user wishes to raise the height from 29" to 30½". These are flush front and back. Swing front on drawer mechanically adds ample working space for handling contents.

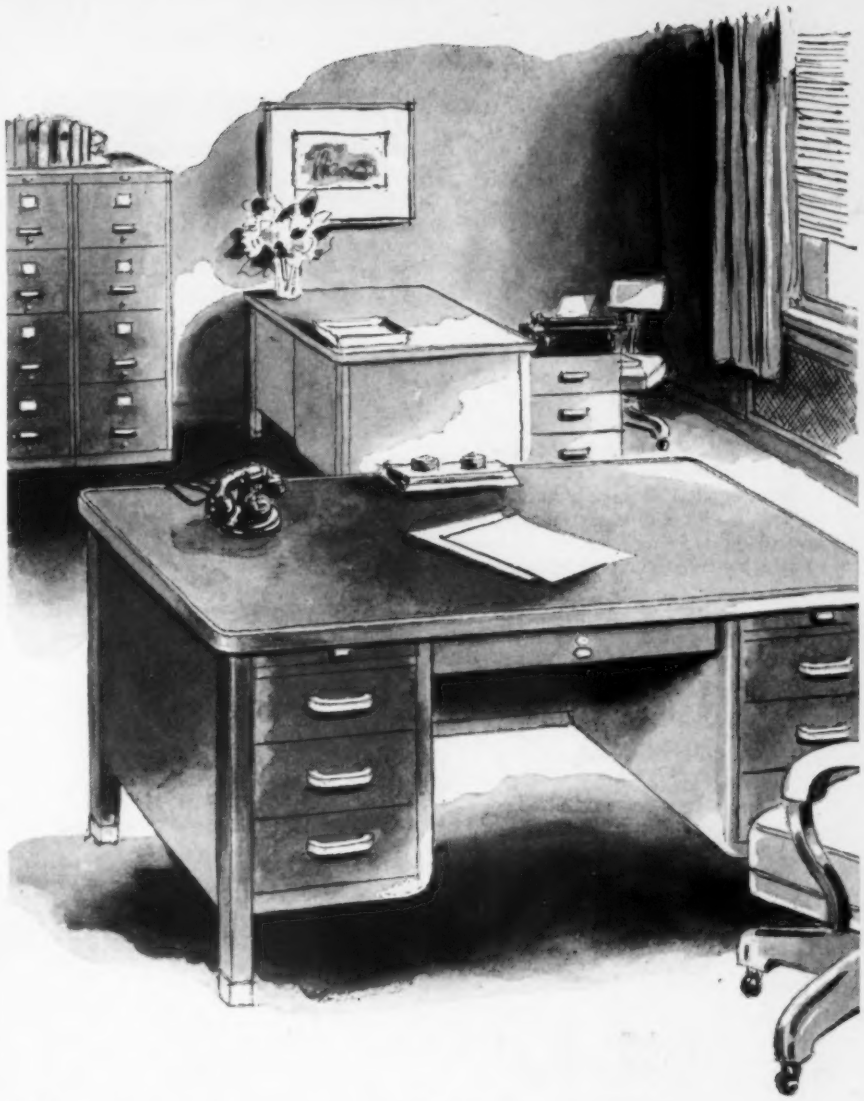
Two- and three-drawer rigid front filing cabinets are of the same design as the Super-Filers. However, they have sliding compressors as standard rather than the self-adjusting Divide-a-Files, and they do not have the swing front.

NEW MIDGET STAPLER



A striking example of the modern trend toward greater efficiency with smaller units is the new midget "Tot 50" stapler and tacker now being introduced by Speed Products Company of Long Island City, N. Y. About the size of a package of gum, this amazingly strong little tool is made of chrome finished steel with durable tenite plastic top and is built with an open channel for split-second staple loading. Its name is derived from the fifty jobs it can do in offices, etc., where stapling and tacking of paper, files, forms, etc. are required. It binds up to twenty sheets of paper and carries fifty staples to a loading. The stapler and one thousand standard staples come in a vest-pocket size plastic box with hinged cover.

(*Please turn to page 224*)



Sit down to a pleasant day . . .

An attractive office, complemented by fine furniture, is the natural requisite of pleasant working conditions. Add to this the designed efficiency and the long life of all steel construction and you have *Security's* new 4 LEG LINE Desks . . . a complete desk line for executive and general offices.

4 Leg LINE

4SF-60 Flat Top Desk

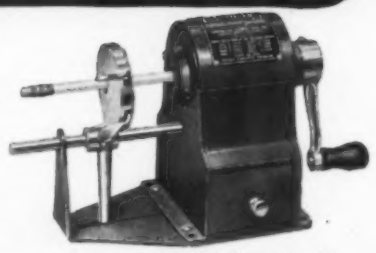
SECURITY STEEL EQUIPMENT CORP. AVENEL, N. J.

A LINE TO BUILD ON Security STEEL

World's Finest Pencil Sharpener...
PAYS FOR ITSELF WITH SAVINGS ON PENCILS!

Here's the finest pencil sharpener you can buy! Heavy-duty, twin-milled, over-size cutters have 28 cutting edges—over 67" of case hardened, honed cutting surface which sharpen over 125,000 points. Automatic Feeding Device ends pencil waste—permits operation as a portable model. Complete with Pencil Stop and Point Adjuster. Sharpens all size pencils and wood case crayons. Gives years of trouble-free sharpening service

• *For demonstration, see your Apsco dealer, or write us.*



APSCO "Climax No. 3"

APSCO "Dandy"

APSCO "Wizard"

Apsco *Pencil Sharpeners*

AUTOMATIC PENCIL SHARPENER CO.
1817 EIGHTEENTH AVENUE, ROCKFORD, ILLINOIS
SALES OFFICES IN NORTH HOLLYWOOD AND TORONTO

For Winning Forms
BE AHEAD *with* **RISING**

For forms of clean appearance, sharp printing, and good wearability—Rising Bond is the paper to choose. Ask your printer if he does not agree that the best paper for forms is

Rising Bond

✓ White and 5 colors ✓ 25% rag
✓ 4 weights ✓ Envelopes in six sizes
✓ Excellent printing surface for engraving, lithography, gravure or letterpress

WHEN YOU WANT TO KNOW... GO TO AN EXPERT!
Rising Papers
Rising Papers
ASK YOUR PRINTER... HE KNOWS PAPER!
Rising Paper Company Housatonic, Mass.

SIX AND EIGHT DRAWER CABINETS ADDED TO MODEL LINE

Two new styles have been added to line of small metal cabinets made by the Model Box & Cabinet Co., Inc., 205 W. Wacker Drive, Chicago 6, Ill. One is a six-drawer cabinet, four drawers being 2½" deep with no dividers, and two drawers 1¼" deep with dividers for twelve sections each. Number two is an eight-drawer design with four drawers 1⅞" deep and four drawers 1¼" deep, all with dividers to make 12 sections per drawer. Over-all size of both cabinets 160¼" wide, 8" high, and 10" deep. Cabinets are of heavy gauge steel with brown Hammerloid finished, with card holders and pulls on each drawer.

CREDIT BALANCE ADDING MACHINE SHOWS BALANCE IN COLOR

Two new credit balance adding machines—the first to visually indicate credit balance in color—have been placed on the market by Clary Multiplier Corporation.

Guess work in credit balance operations is eliminated by the new Clarys, which are entirely automatic as well as all-electric. There are no special credit balance levers to move, no extra buttons to push and no totals to unlock in order to find out whether the machine is on the debit or credit side.

A bright red signal above the keyboard flashes the instant a credit balance is reached. In addition to this visual indication, all subcredits and total credits are printed on the tape in stop-light red with identifying symbols also in color to distinguish them from the black positive totals.

All totals, whether debit or credit, are spaced apart from entries so they stand out on the tape like headlines. It is possible on the Clary to start with either a plus or a minus amount and add to or subtract from it. Whenever more is subtracted than has been added, the red signal glows through the tiny window above the keyboard.

Clary adding machines are claimed to be the world's fastest. By employing the principle of rotary action, they operate at the rate of 188 cycles per minute. Totals, either debit or credit, are arrived at in one-third of a second by touching one motorized control bar.

(*Please turn to page 226*)

LOVE LETTER DEPARTMENT

Allow me to express my sincere appreciation of your fine down-to-earth magazine, PURCHASING.

—Charles R. Sprenkle, Purchasing Agent, Mummert-Dixon Co., Hanover, Pa.

Thanks for giving us a good magazine.

—Ross Burnes, Purchasing Agent, Scripto, Inc.

Mr. Moore, Director of Purchasing, and myself have always enjoyed reading the magazine.

—O. W. Johnson, Asst. Director of Purchasing, United Air Lines, Chicago

Truly the magazine for men in purchasing.

—Maynard A. Petersen, Asst. Purchasing Agent, Minnesota Mining & Manufacturing Co., Los Angeles

Very much pleased with it.

—J. F. Cooper, Maysteel Products, Inc. Mayville, Wis.

I enjoy reading it.

—C. W. Huenke, Purchasing Agent, Kennard Corporation, St. Louis, Mo.

By far the best publication of its kind that comes across my desk.

—Fred H. Waldhaus, Purchasing Agent, Thomas Truck and Caster Co., Keokuk, Iowa

We find very interesting articles in it every month.

—M. Van Zuidam, Purchasing Dept., Perfection Gear Co., Harvey, Ill.

A wonderful magazine.

—A. G. Vedder, Asst. Purchasing Agent, Landis Machine Co., St. Louis, Mo.

Very informative and useful.

—T. M. Smith, Purchasing Agent, Sperti-Faraday, Inc., Adrian, Mich.

For the past ten years I have read each month's issue from cover to cover.

—Alfred A. Noracker, Asst. Purchasing Agent, M. W. Kellogg Co., Jersey City, N. J.

I always read it from cover to cover.

—F. H. Hollister, Purchasing Agent, Ingersoll-Rand Co., Painted Post, N. Y.

I thoroughly enjoy it.

—J. K. Widmer, Purchasing Agent, Brown-Brockmeyer Co., Dayton, O.

TRY ONE on the house!

TRYREX—the pencil with the special shape that fits your hand—will not roll.

Try for yourself . . . see why, for most efficient work, you should choose Omega. Check for stronger lead . . . brilliant color . . . the thin lead that holds a needle point . . . lightness of pressure required for clean, sharp figures . . . colored ends for instant selection . . . waterproof. Check all these points, at our expense.

•

A request on your business letterhead will bring you a sample.

OMEGA COLORED PENCILS

MAKERS OF ROYAL SCOT AND FUTURA

RICHARD BEST PENCIL CO.

Dept. P, SPRINGFIELD, N. J.

Why Sheppard Envelopes?

THEY LOOK BETTER —

The designing, printing, color-matching reflects highest quality work. Note the smooth, locked seams and easier typing and filling.

THEY TASTE BETTER —

Sure, we've got fancy sealing machines but everybody has to lick an envelope sometimes. That's why it pays to insist on the Mint-E-Seal Sheppard flap. It costs no more. It sticks better.

THEY WORK BETTER —

From the easy-open banding and good looking durable cartons right down to putting the envelope in the mail, Sheppard envelopes are easier to use. Even the flaps are scientifically cut to least interfere with typing and stencilling.

Write today for sample book and amazing price values.

Sheppard with the flavor seal flap
ENVELOPES
1 Envelope Terrace
Worcester 4, Mass.

STRIKING LABELS at low cost!

Fent-Onamel
TRADE MARK REG. U. S. PAT. OFF.

- sparkling colors on hard, snow-white stock
- sharp, perfect lettering
- extra-strong adhesive

Increase sales, dress-up your packages, speed up deliveries with FENT-ONAMEL labels. They're *different* - the only labels of their kind made.

Write TODAY for samples & prices

FENTON LABEL CO.
DEPT. F1, 506 RACE ST., PHILA. 6, PA.
Please send prices and samples of shipping labels and stickers for _____ (TYPE OF PRODUCT)
Name _____
Firm _____
Address _____

"VOICE ON WIRE" DICTATING AND TRANSCRIBING MACHINE

The "Voice on Wire" Dictascriber, being marketed by the Magnetic Corporation of America, Chicago, Ill., utilizes spool of wire with capacity for full hour of recording, the wire having almost unlimited reuse. If material is wanted for future reference, the spools may be stored indefinitely. One of the features is stop, start and automatic back spacing food pedal. Dual-purpose microphone enables the dictator to talk into or listen to his own dictation and to make changes, and a noisless, high-speed forward or rewind enables the user to refer to any portion of the recorded material in a matter of seconds.

The dictascriber weighs but 27 pounds and is conveniently portable.

Another feature of the machine is an automatic volume control that makes it possible to record the voice at proper level, whether loud or soft. This makes for practical recording of telephone conversations. Even with the microphone hidden in a desk drawer, the voice is perfectly recorded, according to the Magnetic Corporation.

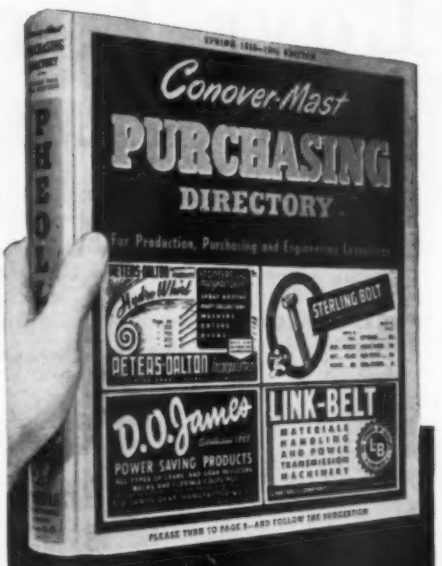
The machine weighs but 27 pounds and is housed in a conveniently portable case.

NEW MACHINE CUTS COST OF ROUTINE BUSINESS LETTERS

A brand new machine known as the Carlson Selector Robotyper, just announced by the Robotyper Corporation, 18050 Ryan Road, Detroit 34, Mich., is said to make most letter writing, especially the handling of routine mail and memorandums, a simple, quick and comparatively inexpensive operation. Hence the new machine, in view of the fact that some business letters may cost as much as 75¢ each, is attracting a great deal of attention.

A card known as the Carlson Selector Card on which a series of numbers indicate precomposed paragraphs that may be used in answering routine letters, making routine reports, etc., is used by the department head or letter writer. The writer simply circles the number or numbers of the paragraphs to be used, attaches the card to the letter to be an-

It is made for YOU



so it's complete—
but EASY to use

In building this Directory for purchasing, production, and engineering executives, all non-industrial listings and advertisements are rigidly excluded. That's why it's so compact—yet complete.

Reference to the CONOVER-MAST PURCHASING DIRECTORY is the easiest and quickest way to find sources of equipment, products, and supplies used in industry.

✓ **CONOVER-MAST PURCHASING DIRECTORY is complete, and it's easy to find what you're looking for. Use it regularly—the more you use it the better you'll like it.**

Conover-Mast
PURCHASING
DIRECTORY
737 N. Michigan Ave., Chicago 11, Ill.

swered and routes them to the Robotypist or machine operator. The operator punches a hole opposite the number circles, inserts the card in the Selector, manually types in the address and salutation, presses a start button, and the machine automatically finishes the letter. In the meantime the operator is free to process other Robotypers or do other work.

The Selector automatically selects and types the indicated paragraphs, perfectly matching the manually typed address and salutation. Carbon copies are made the same as with the manually typed letter. In event the Selector is not being used for automatic letter writing, it may be operated manually without making any adjustments in the machine.

If the automatically written letters call for fill-ins, the machine automatically stops—the operator types in the necessary material, after which the machine automatically finishes the letter.

Printed matter giving detailed information about the use of Robotypers will be furnished upon request.

NEW FOLDING CHAIR MAKES OVERTURNING DIFFICULT

The American Seating Company, Grand Rapids, Mich., has developed a new folding chair known as the No. 44, which is said to eliminate most of the usual folding chair faults and frailties. The 44's Y-type tubular-steel construction evenly distributes the sitter's weight, and renders toppling or overturning difficult. It is cleanly designed to fit the human form scientifically, light in weight, and has no sharp edges or corners to tear garments. Rubber feet prevent slipping.

PEN-SIZE STAPLER

The Duo-Fast pocket stapler, is new product of the Fastener Corporation, Chicago, 14, Ill. About the size of a pencil it is 5" long, weighs 1½ ounces, and holds 100 staples, and the company states that it will fasten 12 sheets of paper as securely as two. The stapler has a plastic barrel, with the mechanism and cap in chrome.

(*Please turn to page 228*)

one writing with UARCO forms!

Do your billings call for many copies? That need not mean many *writings* . . . nor many *carbons* . . . nor even a billing machine! See how this business supply firm turns 'em out on *ordinary typewriters*—using the new UARCO Adapter and UARCO Fanfold Forms:

Two copies for the customer . . . two for the Credit Dept. . . . one each for Commission, Accounting, Payroll, and Factory. *Eight* copies in one writing—but wait! Split commissions require two *more.* And these, too, can be added without difficulty—still one writing!

Magic? No, it's the low-cost UARCO Adapter shown here, a simple device that makes *any* typewriter a billing machine. It feeds forms in packs of 500 or more sets . . . interleaving the *same* carbons through them all! You get as many copies as the job requires.

Call your UARCO Representative now for a free demonstration. He'll make a complete survey to find where you can save the most.

UARCO INCORPORATED

Factories: Deep River, Connecticut; Chicago, Illinois; Cleveland, Ohio; Oakland, California.

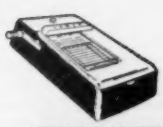
Sales Representatives in All Principal Cities.

CONTINUOUS-STRIP FORMS FOR TYPEWRITTEN AND BUSINESS MACHINE RECORDS

UARCO INCORPORATED

Business Forms

CONTROL-PUNCHED FORMS



AUTOGRAPHIC REGISTERS AND REGISTER FORMS

SAVE TIME WITH THE MORRIS *Phone Rest*

Why buy useless, inefficient phone rests? A Morris rest actually RESTS on the shoulder without crimping or cramping. Easily adjustable for either shoulder, and any angle. Assures more work with less effort and irritation.

Specify the MORRIS PHONE REST when you order—from stationery stores. Sold everywhere, or write direct.

THE *Bert M. Morris* COMPANY
8651 WEST THIRD ST. • LOS ANGELES 37, CALIF.

MACHINE COUNTS ANYTHING FROM DOLLAR BILLS TO TICKETS

A machine that accurately counts anything from dollar bills to world series tickets at speeds up to 1,000 per minute, has been introduced by Pitney-Bowes, Inc., Stamford, Conn. An optional imprinting device permits dating, coding, endorsing or cancelling while counting. The new machine is known as the Model TIC "Tickometer." Among the items handled at speed ranging from 500 to 1000 per minute are checks and currency, tickets and coupons, labels and cards, stubs and receipts, sales and production slips, etc. The company states that the new machine offers 100% counting accuracy; is simple and safe to run, requires no extensive training, and feeds and stacks automatically. It has two counters. One is a "set back" counter, controlled by a knob, for recording individual or partial runs; the other, which is inaccessible and tamper-proof, records cumulative totals.

DESK FILE FOR CALLING CARDS

Handy desk file for business calling cards, tradenamed the "Kallin-Kard-File", is being marketed by the Rampe Manufacturing Co., 3029 Prospect Ave., Cleveland 15, Ohio. The case, 4" x 6", is made of plastic in marble-brown, and provides capacity for several hundred cards. It comes complete with alphabet-index cards and metal back support.

PORTABLE WIRE RECORDING DICTATION AND TRANSCRIPTION MACHINE

The accompanying illustration shows portable all-purpose dictation and transcription machine manufactured by the Wireway Corporation of America, 1331 Halsey Street, Brooklyn, N. Y. The machine is 13" x 9½" x 6½" and weighs 22 pounds. The machine records on wire, utilizing a stainless steel wire which is sufficient for two hours' continuous dictation. Correction of errors is merely a matter of a quick rewind and redictating. A telephone pickup simplifies telephone dictation with natural-voice clarity and true fidelity. The machine operates on AC only, 105-120 volts, 60 cycle. It is also available in 220 volt, 50 cycle AC or 60 cycle AC and 110 volt, 50 cycle AC. Printed matter is available.

National
Cedar-King
WITH PROCESSED FUSE-TEX LEADS
CONTAIN THE STRONGEST AND SMOOTHEST LEADS YOU CAN BUY FOR COMMERCIAL USE.
NATIONAL PENCIL CO.
SHELBYVILLE, TENN.
220 FIFTH AVE.
NEW YORK
N. Y.
If your local supplier cannot serve you . . . write to us for free sample

HEYER ★ FOR EVERYTHING in Duplicating
EVERYTHING FOR GELATIN DUPLICATING
When it comes to duplicating reports, price lists, bulletins, or announcements . . . you, too, will find that a Heyer gelatin roll or film gives a clearer, stronger impression.
Made of brilliant copying, and highest quality materials . . . Heyer Gelatin Rolls or Films find favor everywhere. And remember . . . they are available for any make or model duplicator.
Write for Complete Catalog
Offered by Leading Dealers Everywhere
THE HEYER CORPORATION
1886 South Kostner Avenue • Chicago 23, U.S.A.

Do your File Clerks make more money than you?

Combined salaries of filing department personnel often add up to more than the income of a top executive! Yes, filing is costly! Oxford Pendaflex hanging folders will reduce filing department costs 20% or more. Guaranteed to make filing faster, easier, more accurate.

Send for catalog today.

OXFORD FILING SUPPLY CO., INC.
Garden City
N. Y.

Don't file it — HANG IT!

Oxford
PENDAFLEX®
HANGING FOLDERS

Exclusive Redifixt *Features*
W-2
1950 TAX FORMS
IN STOCK AT LOWEST PRICES
FEDERAL-STATE Social Security
N. Y. FORM 105
for
TABULATOR-N.C.R.-ADDRESSOGRAPH

NEW
STANDARD
Redifixt BUSINESS
FORMS
CONTINUOUS SINGLES
INVOICES—CHECKS
BILLS OF LADING
•
NO QUANTITIES TOO SMALL
FAST DELIVERIES
PRODUCED ON
POST WAR ROTARY PRESSES

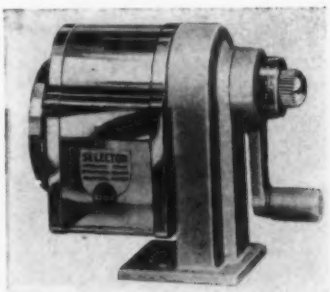
CONSOLIDATED
BUSINESS
SYSTEMS, INC.
30 VESEY ST., N.Y. 7, N.Y., DEPT. 006

DUAL PURPOSE ALL STEEL TRANSFER FILE

All steel transfer file which can be used as a permanent transfer case and also serve as an add-on unit for a general office file, is being introduced by Maso Steel Products, 81 W. van Buren St., Chicago. The case is made of heavy gauge steel and has ⅜" channel iron reinforcing welded on front and back, which permits stacking ceiling high. Drawers are free running with four rollers, two top and two bottom. Front is provided with card holder and steel handle. Files are available in both legal and letter sizes, with follower blocks optional. They are finished in olive green baked enamel.

PENCIL SHARPENER FEATURES POINT SELECTER

"Selector" model pencil sharpener being put on the market by the Automatic Pencil Sharpener Co., Rockford, Ill., features outside point selector and dial which can be adjusted to produce nine or more points ranging from broad to line.



The dial-a-point can be adjusted to produce nine or more points

In addition to the dial-a-point there is a dial which serves as a centering disc to hold all current size pencils and wood case crayons firmly in place. All types of wood case pencils and crayons can be sharpened without splitting lead. Cutters are case-hardened and under-cut.

PARCEL POST C.O.D. SYSTEM CUTS PAPER WORK

A system for handling shipments of C.O.D. parcel post mail, approved by postal authorities, which practically eliminates rewriting of forms and checking records, is announced by Simpliform Business System Co., 2035 Washington Ave., St. Louis, Mo. The system centers around the use of an interleaved one-time carbon in five strips of numbered labels, three of which have an adhesive backing. The perforated strips provide sufficient copies for shipping and record keeping needs. These include customer's mailing label, c.o.d. tag label, post office mailing receipt, office postal receipt form, office record copy, and customer's advice of shipment. In addition a simple, automatic method is provided for receiving and recording money orders without additional entries or bookkeeping. Seven steps are saved compared with the old method of preparing parcel post C.O.D. mail.

50th Anniversary

Since 1900 we have specialized in the manufacture of high quality lightweight papers which are used for Records, Forms, Thin Letterheads, Copies of Correspondence and Advertising Literature. They greatly reduce Typing, Mailing and Filing expenses.

ESLEECK
THIN PAPERS

Air Mail Bond
Clearcopy Onion Skin
Fidelity Onion Skin
Laid Thin Papers
Prestige Onion Skin
Superior Manifold
Thin-Opaque

Ideal for Air Mail, Branch Office and Foreign correspondence

SEND FOR SAMPLES

ESLEECK
Manufacturing Company
Turners Falls, Mass.

Among the ASSOCIATIONS

Chicago Association Annual Products Show February 14, 15, 16

The 16th annual Products Show sponsored by the Purchasing Agents Association of Chicago will be held at the Hotel Sherman on February 14, 15 and 16.

More than 100 leading manufacturers and industrial distributors will display their 1950 lines at the show. The Chicago Association, with over 800 members, represents firms with a combined purchasing power of more than five million dollars a year. It is the largest unit in the National Association of Purchasing Agents.

R. L. Krueger, assistant purchasing agent of the Goodman Manufacturing Company, and chairman of the show, has estimated that attendance will run over 15,000. The show will open at noon and close at 10:30 p.m. every day.

Banquet on Final Night

Highlight of the show will be the banquet to be held on the final night, Thursday, February 16, in the grand ballroom of the hotel. Charles Milton Newcomb, well known industrial relations counsel, will be the principal speaker.

EASTERN NEW YORK ASSN. HAS PAST PRESIDENTS' NIGHT

The fifth annual Past Presidents' Night Meeting of the Purchasing Agents Association of Eastern New York was held at Wolferts Roost Country Club, Albany, N. Y. on Thursday, January 19.

The meeting was conducted by the following past presidents, acting in the positions indicated: national director, R. Van Laer; president, C. P. Spuck; vice-president J. L. Hodgkins; treasurer, C. F. Straney; secretary, George L. Brown; executive committee, Amos K. Munson, George L. Fuller, H. L. Erlicher. Acting committee chairmen were past presidents George L. Fuller, program; A. J. Tailby, education; William B. Gardner, publicity and convention; H. H. Frair, membership; George B. Tod, commodity committee. Reports on commodities were given by past presidents as follows: coal, George L. Fuller; cotton, James J. Elder; iron and steel products, Frank M. Roos; iron and steel scrap, J. J. Perry; lumber, T. C. Latham; non-ferrous metals, Harry L. Erlicher; paper, A. J. Tailby; petroleum products, William B. Gardner; rubber, C. P. Spuck; wool, George L. Brown.

R. M. Bleak, manager of commodity research, General Electric purchasing department, gave one of his regular talks on new developments in business trends.

The "Commodity Research and Forecasting" course sponsored by the association began on January 17. It is a ten-week course, with a one hour per night session, and is held in the State Bank Building, Albany.

AL HAYES GUEST SPEAKER AT PITTSBURGH MEETING

A closed meeting of the Purchasing Agents of Pittsburgh was held at the Hotel William Penn on Tuesday, January 17.

Guest speaker was F. Albert Hayes, Director of Purchasing, Bigelow-Sanford Carpet Company, New York, N. Y. Mr. Hayes, a past president of the National Association of Purchasing Agents spoke on "The Purchasing Manual As A Useful Tool." The meeting was arranged by Miss Genevieve Gray, D. E. Winslow and R. C. Wenz, of the program committee.

Philadelphia Association Elects Officers

Standing, left to right: E. Wayne Jenkins, Coleman & Company, secretary-treasurer; R. George McMinn, The Berwind-White Coal Mining Company, national director. Seated, left to right, M. L. Lampe, Armstrong Cork Company, first vice-president; P. J. Clarke, Rohm & Haase Company, president; and A. H. Reynolds, Jr., Leeds & Northrup Company, second vice-president.

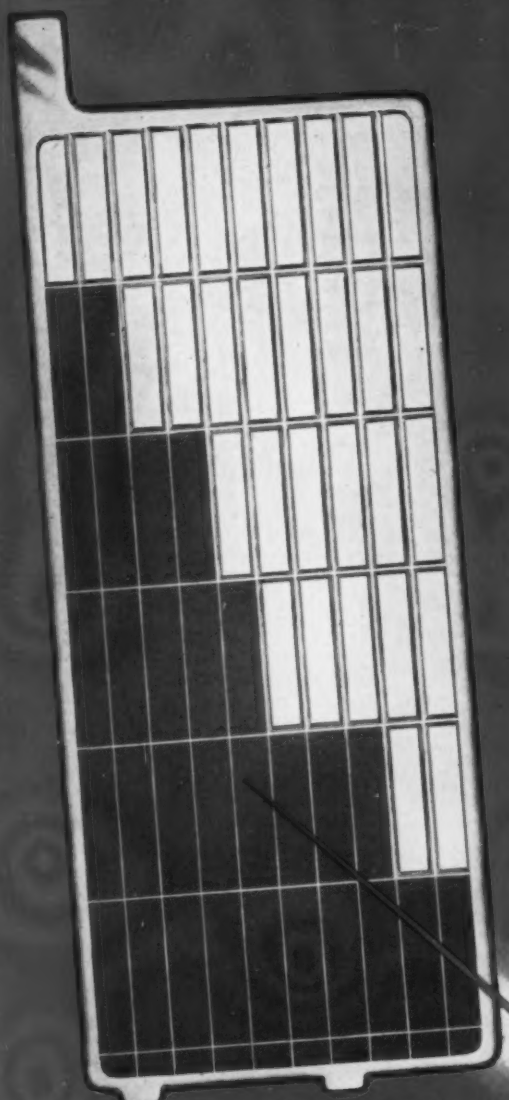
New officers of the Purchasing Agents Association of Philadelphia, elected at the December meeting are shown above. Directors of the association for 1950 are: Harold G. Adams, American Dredging Company; Clinton Bishop, Alan Wood Steel Company; W. Earle Bodine, The Moore & White Company; Merle S. Charlton, The Atlantic Refining Company; A. E. Miller, Pennsylvania Salt Mfg. Company; H. R. Senior, Continental Mills, Inc.

Harold I. Patten, 1518 Walnut Street, Philadelphia 2, Pa., is the executive secretary of the association.

(*Please turn to page* 232)

NEW GOULD "Z" Plate

THE ONLY PLATE WITH OXIDE THAT RENEWS ITSELF!



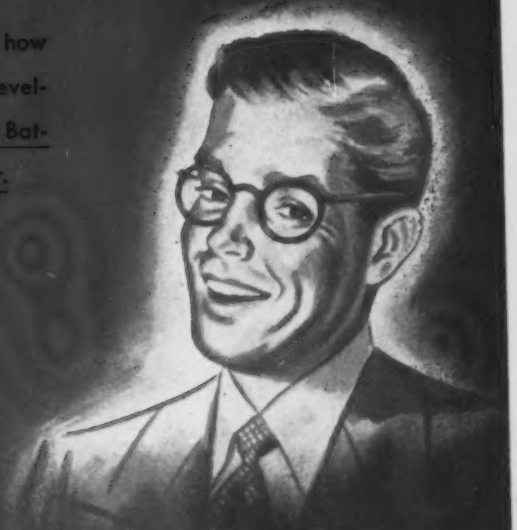
Only Gould gives you a power-producing regenerative oxide that renews its energy every day the battery is in use.

And—Only Gould's revolutionary, new "Z" grids are non-porous and solid all the way through.

The "Z" plate is the result of new techniques developed and perfected in the Gould Research Laboratory and proved in Gould's own pilot plant.

These exclusive Gould developments are why Gould batteries move more tons more miles . . . operate at full capacity more months . . . give more for your battery dollar than ever before.

Ask for literature on how Gould's new research developments make Gould Batteries Stay New, Longer.



The Gould "Thirty"...
More Than Ever, America's Finest
Industrial Truck Battery

GOULD

STORAGE BATTERY CORPORATION

TRENTON 7, NEW JERSEY

Always Use Gould Automobile and Truck Batteries

"Bosses" Are Guests at Chicago Women's Division Meeting

The board of governors and officers: (seated) Rhoda M. Stewart; Louis E. Leverone (guest speaker); Edna Swihart; Ruth Dux; Grace Bell; (standing) Kathleen Cummings; Florence Hayes; Alice Rowbotham; Edna Wisthoff; Helen Haase.

A group of members and guests: F. K. Stamm; Mary Corcoran; Annette O. Schmidt; Mary A. Clancy; Wm. R. Zeh; Virginia Reid; Anne Walters; Eve Mecher; Robert Shattuck; Helen Daubert.

At a recent meeting of the Women's Division of the Purchasing Agents Association of Chicago, held in the Civic Opera Building, the ladies had their "bosses" as guests.

Principal speaker at the affair was Louis E. Leverone, president of the Automatic Canteen Company, and president of the National Aeronautic Association.

Arrangements for the dinner were handled by Ruth Dux, purchasing agent for Lenz Electric Company. The program was arranged by Robbye McWhorter, purchasing agent for Permoflux Corporation, assisted by Mary Corcoran, purchasing agent for the American Broadcasting Company. Edna Swihart is president of the Women's Division.

HEINRITZ TELLS NEW YORK ASSOCIATION OF INDUSTRY UNDER THE LABOR STATE

A regular meeting of the Purchasing Agents Association of New York was held in the Builders' Exchange Club on January 17.

Stuart F. Heinritz, Editor of PURCHASING, was the principal speaker. Mr. Heinritz, who recently completed an on-the-spot study of industrial procurement in England under socialist planning, spoke on "British Industry Under the Labor State". A complete report on Mr. Heinritz' observations and conclusions, based on personal interviews with leading English purchasing executives, visits to all types of plants in numerous industries, and discussions with management, labor and government representatives, was begun in the December issue of PURCHASING.

Guest speaker at the regular afternoon forum was Dr. H. E. Luedicke, Executive Editor of the New York Journal of Commerce. Dr. Luedicke, an outstanding commodity expert, discussed hedging and how it can be used to avoid losses in such commodities as rubber, hides, and non-ferrous metals. This was the first time that the subject of hedging in commodities had been formally scheduled by the association.

WISCONSIN N.I.G.P. CHAPTER HOLDS ANNUAL ELECTION

Both 1949 officers of the Wisconsin Chapter, National Institute of Governmental Purchasing, were reelected for the coming year at the group's regular meeting held in December.

They are: Maurice Parks, purchasing agent for Dane County, president; and Barney Gill, purchasing agent for the city of Madison, secretary and treasurer. Joseph W. Nicholson, purchasing agent of the city of Milwaukee, is honorary president of the chapter.

Discussion at the meeting centered chiefly on the N.I.G.P. 1950 convention, which will be held in Milwaukee in October. A committee was appointed to prepare the convention program, and tentative plans were made for improved handling of the exhibit side of the conference. A. H. Hall, executive director of N.I.G.P., came from Washington for the meeting, and discussed problems of the convention with the members.

H. L. ERLICHER GUEST AT TORONTO ASSN. MEETING

Harry L. Erlicher, vice president-purchasing of the General Electric Company, Schenectady, N. Y. was the guest speaker at a regular meeting of the Purchasing Agents Association of Toronto, held in the Royal York Hotel on Wednesday, January 11. Mr. Erlicher spoke on "The Purchasing Agents Place in Progressive Management".

The third series of the association's Toronto University courses began on January 10, and the weekly sessions will continue up to and including March 21. Among the subjects to be covered are: oral expression; expression in writing—business letters; expression in writing—reports; quality control—a tool for the purchasing agent; inventory control and stores; traffic; economics; business trends and cycles; purchasing accounting and records; printing and office supplies.

MID-WINTER CONFERENCE OF PUBLIC UTILITY BUYERS TO BE HELD IN DETROIT

The 19th annual Mid-Winter Conference of the Public Utility Buyers' Group of the National Association of Purchasing Agents will be held on February 13 and 14 at the Hotel Statler, Detroit, Mich.

Four general subjects will be covered in the program—commodities, broad purchasing policies, economics, and an exchange of ideas and experiences in "The Purchasing Work Shop", a panel discussion. Leaders in each of these fields will be among the featured speakers.

The traditional cocktail hour and banquet, with entertainment, will be held on Monday evening, February 13.

C. F. Ogden, The Detroit Edison Company, Detroit 26, Mich., is chairman of the Public Utility Buyers' Group.

TULSA ASSOCIATION NAMES NEW OFFICERS FOR 1950

New officers for 1950 recently elected by the Purchasing Agents Association of Tulsa are:

President, J. C. Nicholson, Tretolite Company; first vice-president, V. M. Lewis, Dowell, Inc.; second vice-president, H. M. Logan, Rockwell Manufacturing Company; secretary-treasurer, E. C. Wolf, Barnsdall Oil Company; national director, C. W. Wallace, Mid-Continent Petroleum Corp.; alternate national director, C. M. Taylor, Cities Service Oil Company; executive secretary, H. M. Cosgrove; assistant secretary, E. R. Welch.

(*Please turn to page* 234)

Courtesy Hyscore Arms Co., Brooklyn, N.Y.

Does This Tubing Idea Hit Your Target?

Aiming for an inventory reduction . . . lower production costs . . . or a sales edge on competition? Try sighting along the tubing idea in this target pistol.

This airgun is accurate within a ¾" bulls-eye on a 20' test range. It is powered by a hardened piston which, in only a 2" stroke, develops enough energy to slam a .22 cal. pellet through a ⅜" pine board.

Note the ingenious design . . . how the entire gun barrel, from piston chamber to gunsight, is cold-swaged from a single piece of seamless steel tubing—a considerable saving over composite construction. The barrel tubing is supplied by Frasse with a special I. D. cylinder finish, to close tolerances—and provides a leakless air-seal for the piston—*without the expense of further machining.* Completion of the barrel requires 15 separate fabricating operations, from swaging and broaching through milling and threading—an exacting application made possible only with quality tubing and engineering teamwork.

Frasse, a leading distributor of steel tubing, stocks a wide range of immediately available carbon, alloy and stainless analyses to work from. But equally available, and equally useful, are Frasse engineering facilities to help you use tubing to your economical advantage. *Call Peter A. FRASSE and Co., Inc., 17 Grand St., New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Ave., Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange St., Buffalo 3, N. Y. (Washington 2000) • Jersey City • Syracuse • Hartford • Rochester • Baltimore*

FRASSE

your best bet 1 for Steel Tubing

Seamless and Welded Mechanical Tubing • Aircraft, Condenser and Pressure Tubes • Stainless Tubing, Seamless and Welded • Stainless Pipe, Valves and Fittings

NEW! For Stainless Pipe and Tube Users!

This new 24 page Frasse manual is brimful of useful data on stainless steel tubular products. Includes type characteristics, physical properties, fabricating data, tolerances, standard finishes, corrosion resistance, and similar essential information. Invaluable for reference if you're working with stainless tube or pipe. Send the coupon for your free copy today.

Peter A. Frasse and Co., Inc. 4-A
17 Grand Street, New York 13, N. Y.

Please send me a complimentary copy of your new handbook on stainless steel, pipe and tubing.

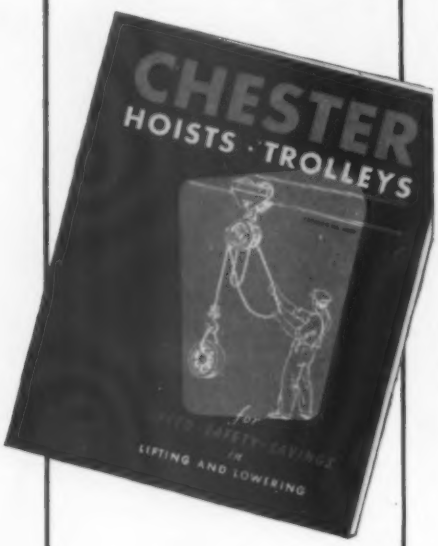
Name: ..... Title: .....

Firm: .....

Address: .....

Want Additional Product Information? See Page 19.

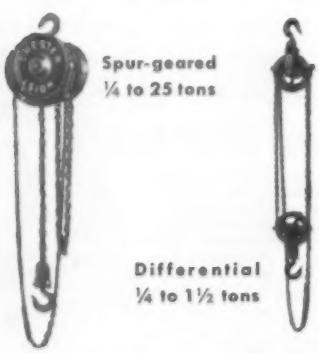
Here's where to get...



USEFUL
HOIST DATA

This new Chester Hoist Catalog gives you complete information for selecting the right hoist for the job. For example:

- Capacities available (Spur-geared and Differential)
- List prices
- Regular lift in feet
- Minimum distance between hooks
- Reach in feet and inches
- Chain pull to lift full load
- Feet of chain overhauled for 1-ft. lift
- Test load in pounds



Spur-geared
¼ to 25 tons

Differential
¼ to 1½ tons

Send for your copy today

THE NATIONAL SCREW & MFG. CO.
Chester Hoist Div. • Lisbon, Ohio

P-1

(*Continued from page 232*)

A regular meeting of the group was held on Thursday evening, January 12, at the Bellevue-Stratford Hotel. The principal speaker was Wellington Roe, labor authority and independent trade union leader. Mr. Roe, president of the National Railway Union, is the author of "Juggernaut: American Labor in Action". From 1944 to 1946 he was special assistant to A. F. Whitney, president of the Brotherhood of Railroad Trainmen. Mr. Roe's subject was "150 Years of Labor in the United States".

NEW ENGLAND ASSOCIATION HAS SALES-PURCHASING FORUM

A regular meeting of the New England Purchasing Agents Association was held in the Hotel Vendome, Boston, on Monday, January 9.

The meeting featured a sales-purchasing forum conducted by Herbert Layport, director of purchases, Wyman-Gordon Company.

At the afternoon conference, a film entitled "Dateline Tomorrow" was shown through the courtesy of the Aluminum Company of America, dealing with the finished products of the company.

CHATTANOOGA ASSOCIATION SET FOR ANNUAL SHOW

The third annual industrial show sponsored by the Purchasing Agents Association of Chattanooga will be held in Memorial Auditorium, February 27 to March 2. The show is expected to surpass last year's event which was an outstanding success. Robert S. Henry is committee chairman for the affair.

The association is sponsoring an educational course which began in January and will be continued over a period of 11 weeks.

What was described as one of the best meetings ever held by the association took place in December when leaders in different fields of finance and industry presented their views on the "Outlook on Business for the Coming Year". The speakers were Joseph H. Lane, president of the Cavalier Corporation; Bradley Currey, vice-president of the American National Bank and Trust Company; T. R. Cuthbert, editor of the Labor World; and Dr. William H. Wesson, professor of economics, University of Chattanooga.

CENTRAL MICHIGAN ASSOCIATION SUCCESSFUL HOLIDAY PARTY

Approximately eighty people attended the Christmas party sponsored by the Purchasing Agents Association of Central Michigan, which was held at the Union Building, Michigan State College, Lansing, Michigan. The association's Educational Committee now has available for use by the members, a number of instruction and educational films on various industrial subjects, in 8 mm and 16 mm sizes.

CODE OF ETHICS ROCK RIVER VALLEY ASSOCIATION

An interesting feature of the Past Presidents' Night Meeting of the Rock River Valley Association held in the Faust Hotel, Rockford, Ill., on January 10 was the attendance of every one of the association's past presidents. Speakers for the evening were Arthur Pearson, Chicago, Vice President of District No. 3 who described the high calibre of the District 3 Conference at St. Louis, and George E. Henry Associate editor of PURCHASING Magazine, whose subject was "The Code of Ethics." Among the various visitors present at the meeting were executives of various companies in the Rockford area. The membership committee announced the addition of four new members who were introduced at the meeting and given lapel pins in the form of the N.A.P.A. insignia. The association now has about 70 members.

The Rock River Valley Association was organized in 1938 by C. M. Oberling, purchasing agent for the National Lock Company, Rockford, who previously had been a member of the Chicago association. Mr. Oberling was president of the new association in 1938-39. Other past presidents present were as follows:

E. P. Olson, Elco Tool & Screw Corp., Rockford, 1940; W. C. Mackey, Free Sewing Machine Co., Rockford, 1941; J. C. Villa, J. L. Clark Mfg. Co., Rockford, 1942; S. V. Linderoth, American Cabinet Hardware Corp., Rockford, 1943; J. M. Stewart, Greenlee Bros. & Co., Rockford, 1944; H. S. Drummer, The Washburn Co., Rockford, 1945; H. H. Hoppock, The W. T. Rawleigh Co., Freeport, 1946; C. C. Ericson, Rockford Screw Products Co., Rockford, 1947; W. L. Young, Micro Switch Corp., Freeport, 1948; President for the 1949-50 association year is A. E. Nelson of the Sundstrand Machine Tool Co. Rockford.

"SPRING PROBLEMS" TOPIC AT M.P.A.C. MEETING

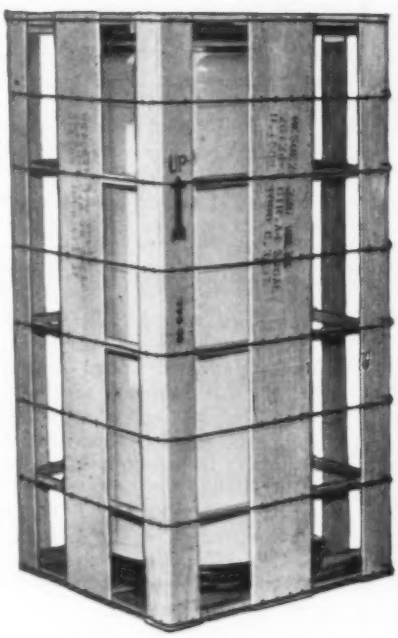
A regular meeting of the Metropolitan Purchasers Assistants Club was held at the Midston House, New York City, on Tuesday evening, January 10.

Guest speaker was R. E. Patterson, director of public relations for the Better Business Bureau of New York. Mr. Patterson discussed the purposes and operations of the bureau, and the services it offers to business men and the general public to protect them against fraud, dishonesty or misrepresentation in financial and commercial dealings.

Mr. Patterson stressed the point that the bureau was the result of cooperative effort on the part of business men to promote fair practice for mutual protection. He said that the service, however, was free to anyone requesting it, whether the inquirer was a member or not. He added that while each local Better Business Bureau was an independent organization, they all worked together and

(*Please turn to page 236*)

General Boxes...



for WATER HEATERS or WRENCHES

or hundreds of other products

General boxes protect the product . . . cut down loss and dissatisfaction. They are lightweight yet extra strong! They are easily and quickly assembled, providing "the best of protection" for hundreds of American products. We will be glad to help design a more economical, a more efficient container for your product. Write us today for complete information.

General

Wirebounds are saving Cessna Aircraft $150,000 per year

Write us today for picture story

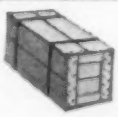
General BOX COMPANY

engineered shipping containers

GENERAL OFFICES:
48 W. Illinois Street, Chicago 10, Ill.

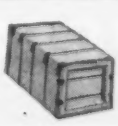
DISTRICT OFFICES AND PLANTS: Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, Meridian, Sheboygan, Winchendon.
Continental Box Company, Inc.: Houston, Dallas.

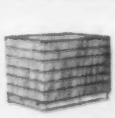
General Wirebound Crate


General Nailed Box

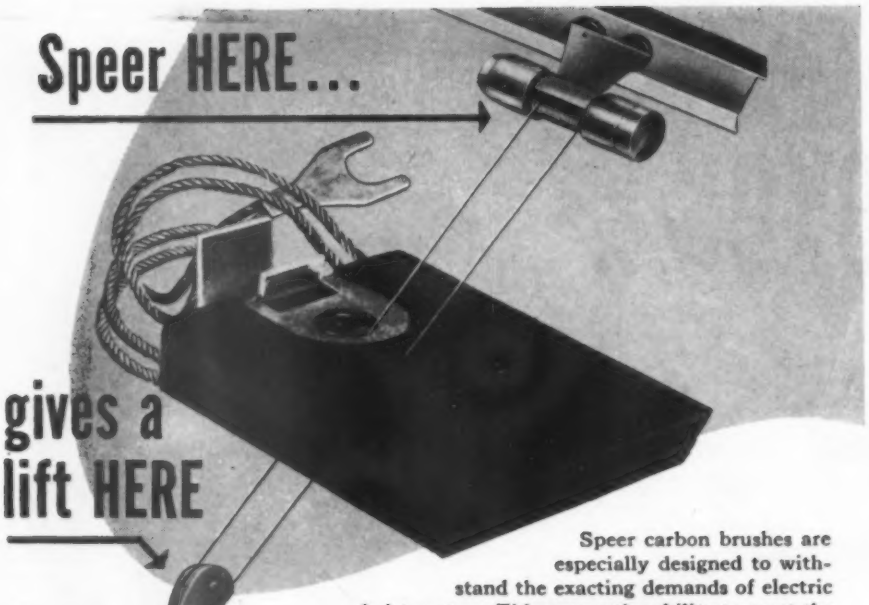
General Corrugated Box

General Cleated Corrugated Container


General All-Bound Box


Generalift Pallet and Pallet Box

General Watkins-Type Box



Speer carbon brushes are especially designed to withstand the exacting demands of electric hoist motors. This means the ability to meet the high starting torque and frequent reversals necessary for full load performance.

By matching brushes to service characteristics, Speer has provided during the past 50 years, a complete line of brushes to meet all motor and generator requirements. Complete experimental and testing facilities are available for analyzing your brush requirements for machine designs or maintenance problems.

Ⓢ 5922

Speer
CARBON COMPANY
ST. MARYS, PENNA.

brushes · contacts · welding electrodes · graphite anodes · rheostat discs · packing rings · carbon parts

CHICAGO · CLEVELAND · DETROIT · MILWAUKEE · NEW YORK · PITTSBURGH

Fight ATHLETE'S FOOT THESE 3 WAYS . . .

HERE'S THE SOUND, TESTED PROGRAM FOR ATHLETE'S FOOT CONTROL:

1. ALTA-CO POWDER

. . . for the all-important foot tub in your shower rooms. One pound to a gallon of water kills common Athlete's Foot fungi *in less than a minute!* Non-irritating; harmless to towels. Easily tested for proper strength with Dolge Alta-Co Powder Tester.

2. ALTA-CO FOOT POWDER

. . . for dusting, gives additional protection against re-infection. Soothes while drying between toes in shoes and socks, this potent but gentle fungicide does its work where Athlete's Foot fungi flourish.

3. ALTA-CO 300 H.D. FUNGICIDE

. . . for your daily, systematic washing of shower room floors. In economical solution (1 to 300), its action is both fungicidal and bactericidal, giving your floors the same hygienic sanitation you demand be taken by each user of your facilities.

Write for 36-page illustrated booklet, "Athlete's Foot—A Public Health Problem".

ALTA-CO

The C. B. DOLGE Co.
WESTPORT, CONNECTICUT

(*Continued from page 234*)

exchanged information when a particular situation required it. Mr. Patterson said that the local bureau had information on approximately 350,000 firms and individuals in the New York area.

The forum part of the program was conducted by Harold Carlson, Carlson Company, on the subject "Spring Problems as They Affect the Purchasing Agent". Mr. Carlson pointed out the advantages and desirability of purchasing springs from a reliable company, not only for protection against inferior quality or deception, but for the engineering advice that is available from reputable firms. A question and answer period followed his talk.

ALABAMA ASSOCIATION HEARS "FORECAST FOR 1950"

The annual Executive Night meeting of the Purchasing Agents Association of Alabama was held in the Thomas Jefferson Hotel, Birmingham, on January 5.

Leading executives of the Birmingham area spoke about fifteen minutes each on "Forecast for 1950" as reflected in their businesses. Frank P. Samford, president of the Liberty National Life Insurance Company covered finance, and M. L. Ruggieri, plant manager, Southern Line Material Company, discussed manufacturing. The forecast for consumer goods was presented by Isadore Pizitz, president, Pizitz Department Store.

The third annual Seller-Buyer dinner of the association will be held at the Thomas Jefferson Hotel on Thursday, February 23. Salesmen serving industry and institutions in the state have been invited, and its is expected that total attendance at the affair will run well over five hundred.

Guest speaker will be T. A. Corcoran, purchasing agent of The Courier-Journal and Louisville Times, and president of the National Association of Purchasing Agents. Mr. Corcoran's subject will be "Let's Look at Our Mutual Problems".

Warren Whitney, vice-president of James B. Clow and Sons, and general manager of National Cast Iron Pipe Division, Birmingham, will speak from the standpoint of top management. His subject will be "You Can't Manage a Purchasing Agent".

RUEDIGER NAMED DAYTON V. P.

President Paul Boorom of the Purchasing Agents Association of Dayton has announced that A. G. Ruediger, Airtemp Division, Chrysler Corporation, is the new second vice-president of the association. He will hold office until August 31, 1950.

Mr. Ruediger has been serving the Dayton association as program chairman, and will continue in that capacity. The office of second vice-president became vacant recently when Albert O. Leckey resigned from the association because of a change in employment.

(*Please turn to page 238*)

FOR NEW CONVENIENCE AND ECONOMY IN YOUR PYROMETER SUPPLIES PURCHASING . . .

Get in touch with your

HSM

something for you to remember

"HONEYWELL SUPPLIES MAN" TODAY!

WORLD'S LARGEST ORGANIZATION FOR ADVANCED INSTRUMENTATION AND CONTROL

Your "Honeywell Supplies Man" has a plan he wants to tell you about . . . a plan that is good because it is good for you!

It will enable you to buy your thermocouple, pyrometer and chart needs much less frequently . . . taking advantage of quantity discounts and avoiding costly and time-consuming paper work.

Your "Honeywell Supplies Man" wants to see you as soon as possible . . . to give you the full particulars, to make a survey of your continuing pyrometer supplies needs and to show you how this new plan will save you money. Call your local Honeywell Branch Office to bring the HSM to your plant at once . . . or complete and mail the coupon to set up a discussion of the plan at your convenience!

MINNEAPOLIS-HONEYWELL REGULATOR CO.
BROWN INSTRUMENTS DIVISION
4408 Wayne Ave., Philadelphia 44, Pa.

Gentlemen:

Please arrange to have a HSM visit me in the near future. Ask him to call for an appointment.

*Name*_____

*Title*_____

*Company*_____

*Address*_____

*City*_____ *Zone*_____

*State*_____

MINNEAPOLIS-HONEYWELL REGULATOR CO.
BROWN INSTRUMENTS DIVISION
4408 Wayne Ave., Philadelphia 44, Pa.
Offices in 77 principal cities of the United States, Canada and throughout the world

MINNEAPOLIS Honeywell — *Advanced Instrumentation* — BROWN INSTRUMENTS

FOR BETTER PROCESSING

Write for Catalog
OF USES
AND SPECIFICATIONS

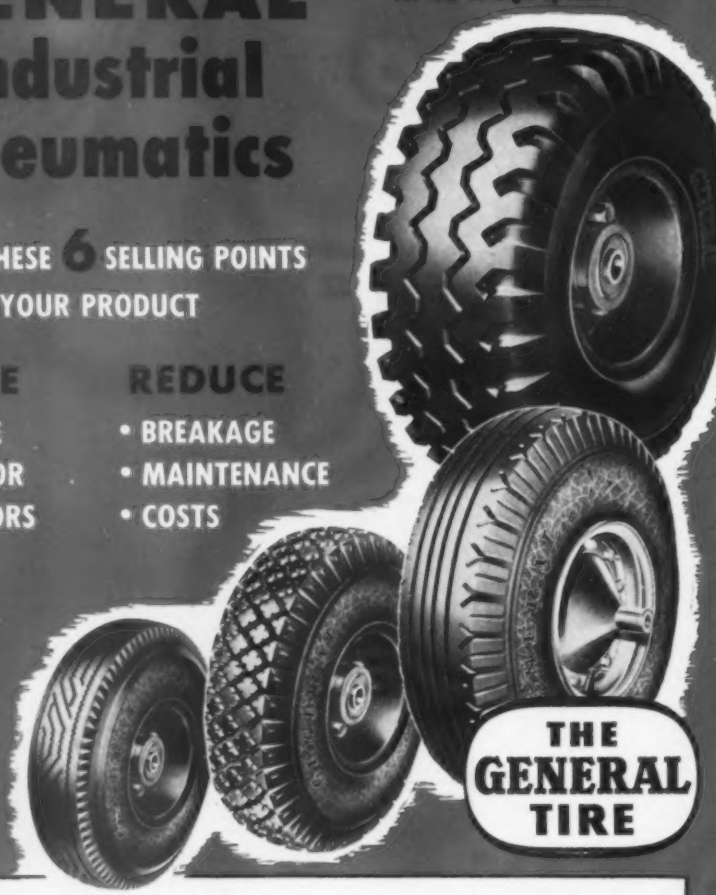
Available in assemblies of Tires, Tubes and Wheels. Size O. D. 8" to 23"—200 to 2000 lbs. capacity for low or high speeds.

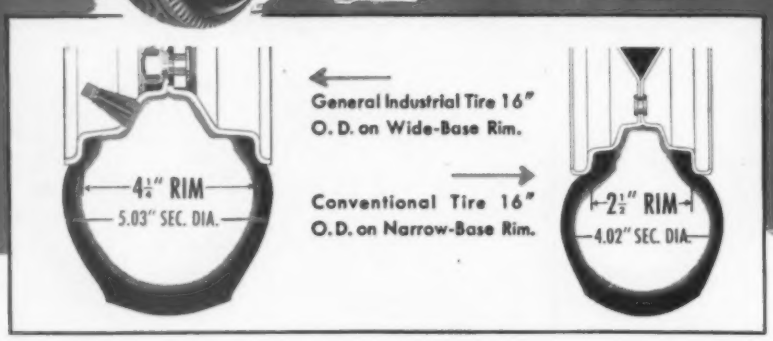
GENERAL
Industrial
Pneumatics

ADD THESE 6 SELLING POINTS
TO YOUR PRODUCT

SAVE
• TIME
• LABOR
• FLOORS

REDUCE
• BREAKAGE
• MAINTENANCE
• COSTS





More AIR VOLUME More STABILITY
More LOAD CAPACITY More MILEAGE

SEND FOR CATALOG . . . DEPT. 7
THE GENERAL TIRE & RUBBER CO. AKRON, OHIO

ROCHESTER BUYERS HEAR TALK BY W. B. WIGHT

A regular meeting of the Rochester Association of Industrial Buyers was held on Wednesday, January 18 at the Daltin Restaurant.

Guest speaker was Wilson B. "Pete" Wight, assistant purchasing agent for Bausch & Lomb Optical Company. Mr. Wight spoke on "What To Do In The Present Market".

WASHINGTON ASSOCIATION HAS JUNIOR MEMBERS' NIGHT

The annual "Junior Members' Night" meeting of the Purchasing Agents Association of Washington was held in the New Washington Hotel, Seattle, on Thursday evening, January 12.

The principal speaker was Professor Albert N. Schrieber, head of the Department of Industrial Management, College of Business Administration, University of Washington, on the subject "Potentials of Tomorrow's Business—A Look into the Distant Future".

Also featured on the program was the awarding of certificates to those who had completed the recent educational course in purchasing policies and procedures sponsored by the association.

A presentation of two hundred dollars was made by the association to Dean Austin Grimshaw of the University of Washington College of Business Administration for the Purchasing Library Fund.

The program was arranged by George S. Greeley, Westinghouse Electric Supply Company, chairman of the Junior Members Committee. Junior members assisting Mr. Greeley were: Joe Yunker, Pacific Car & Foundry Co.; LaVern Crossen, Bethlehem Pacific Coast Steel Corp.; George Nethercut, Monsanto Chemical Co.; L. O. Halvorson, Pacific Marine Supply Co.; W. A. Kunick, Jr., Pennsylvania Salt Mfg. Company of Tacoma; George Neil, U. S. Bureau of Federal Supply; Loran Kreager, Puget Sound Power & Light Co.; and John Roth, Continental Can Co.

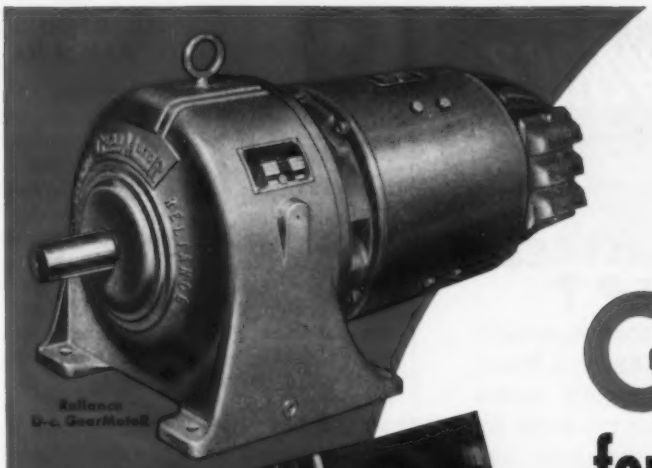
"WATTS IN GLASS" SHOWN TO BUFFALO ASSOCIATION

A regular meeting of the Purchasing Agents Association of Buffalo was held in the Hotel Statler on Wednesday, January 11.

The first part of the program featured a discussion of "Principles and Standards of Purchasing Practice" by Charles L. Sager, of The Crosby Company.

The second part was devoted to a film "Watts In Glass", presented by the Owens-Corning Fiberglas Company. Following the picture there was a discussion period under the direction of educational chairman. Two representatives of the company were present to answer questions and to display Fiberglas products.

(*Please turn to page* 240)



Reliance
D-c. GearMotoR

Users everywhere agree...

It's the

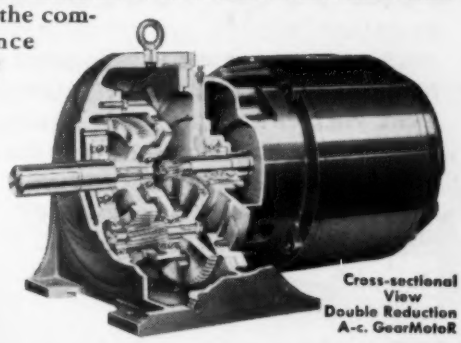
RELIANCE GEARMOTOR

for outstanding performance

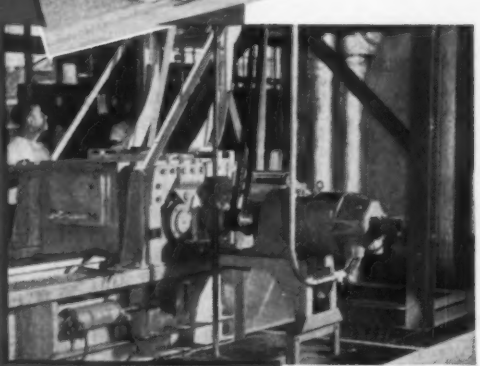
Of the many design and construction features which have distinguished the performance of Reliance GearMotoRs in every type of application in every industry, here are some which should interest you:

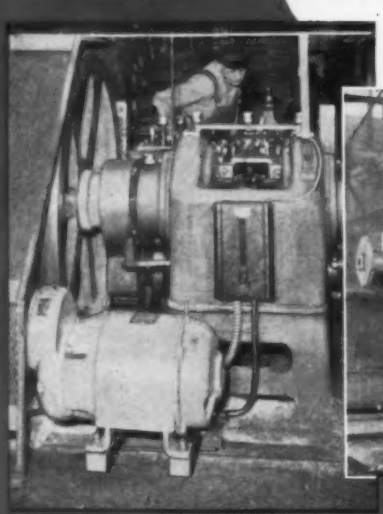
1. Helical, wear-hardened gears cut from alloy steel forgings and shaved before hardening for correct eccentricity and helical angle and bright, smooth surfaces—factors contributing to quiet operation and longer life.
2. Gear arrangement in simple train minimizes number of moving parts—promotes quietness.
3. Pinion and gear supported and spaced to reduce deflection—permits high load-carrying capacity.
4. Splash system with large oil reservoir assures constant and thorough lubrication of all parts.
5. Anti-friction bearing construction throughout.
6. Reliance *Precision-Built* Motors provide the maximum in dependable and economical power.

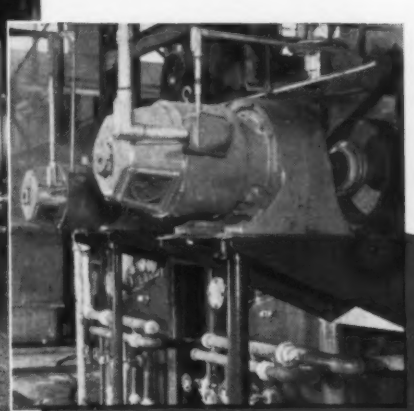
For facts on other proved-in-service advantages of Reliance GearMotoRs, write for Bulletin C-404. Ask at the same time for bulletins describing the complete line of Reliance PRECISION-BUILT Motors.

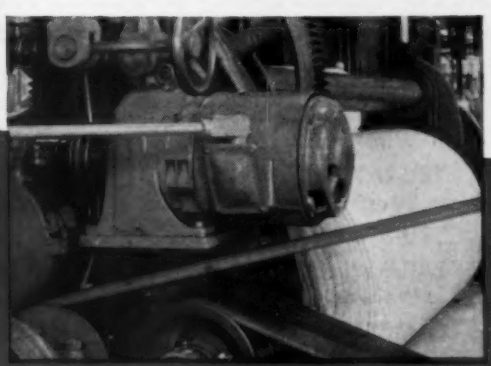


Cross-sectional View
Double Reduction
A-c. GearMotoR









RELIANCE ELECTRIC AND ENGINEERING CO.

1056 Ivanhoe Road, Cleveland 10, Ohio • *Sales Representatives in Principal Cities*

CAN YOU GUESS THE ANSWERS?

IS A HARD OR SOFT MATTRESS BETTER FOR SLEEP?

NEITHER. IT SHOULD HAVE A SOFT SURFACE TO RESPOND TO BODY CONTOURS — A FIRM SPRING CORE FOR PROPER SUPPORT. OWEN WOVEN AND CABELUX UNITS, MADE BY OWEN SILENT SPRING COMPANY, ARE USED BY LEADING MANUFACTURERS TO SOLVE THIS PROBLEM.

HOW IS RUBBER USED TO CUT TOOL STEEL?

SO-CALLED "RUBBER CUT-OFF WHEELS" ARE DISCS OF HARD RUBBER IMPREGNATED WITH FINE PARTICLES OF ABRASIVE MATERIAL. THEY WILL CUT THROUGH THE HARDEST STEEL WHEN USED ON AN ABRASIVE CUTTING MACHINE — MADE BY ACCO'S CAMPBELL MACHINE DIVISION.

ACCO makes many products for Industry, Agriculture, Transportation and the Home

AMERICAN Chain
TRU-LAY and LAY-SET Preformed Wire Rope
TRU-LAY Cable and TRU-LOC Swaged Terminals for Aircraft
TRU-STOP Emergency Brakes
PAGE Wire, Chain Link Fence and Welding Rods
CAMPBELL Abrasive Cutters
READING Steel Castings
READING-PRATT & CADY Valves and Fittings
PENNSYLVANIA Lawn Mowers
MARYLAND Bolts & Nuts
"ROCKWELL" Hardness Testers
WRIGHT and FORD Hoists
HELICOID Pressure Gages
MANLEY Automotive Service Equipment
OWEN Silent Springs

ACCO

AMERICAN CHAIN & CABLE BRIDGEPORT CONNECTICUT

DISTRICT 6 COUNCIL MEETING SET FOR TOLEDO, MARCH 18

T. D. Hudson, Vice President, District 6, National Association of Purchasing Agents has officially announced that the spring council meeting for the district will be held at the Commodore Perry Hotel, Toledo, O., on March 18.

Up to the time of the announcement, Mr. Hudson revealed that he had received only one nomination for district vice-president, that of Bruce D. Henderson, made by the Youngstown Association. He added that nominations would be received by the chair up to the exact time of election.

Those desiring reservations for the council meeting are requested to get in touch with L. J. Schindler, Schindler Stamping & Toy Company, Toledo 6, O.

TRI-STATE ASSOCIATION MEETS

A regular meeting of the Tri-State Purchasing Agents Association was held at Mollie's Hotel, Gallipolis, O., on Wednesday evening, January 18. Feature of the program was the technicolor film "Steel—Man's Servant", shown through the courtesy of the United States Steel Corporation.

SOUTH BEND ASSOCIATION HAS PURCHASING-SALES PANEL

A panel discussion between purchasing agents and salesmen was the feature of a regular meeting of the Purchasing Agents Association of South Bend, held in the Hotel Elkhart on Wednesday, January 11.

This was the first program of its type to be held in purchasing circles in the South Bend area, and aroused a good deal of interest and high attendance by both sales and purchasing men. The formal subject of the panel, which also included open discussion from the floor, was "Proper Etiquette for Purchasing Agents and Salesmen".

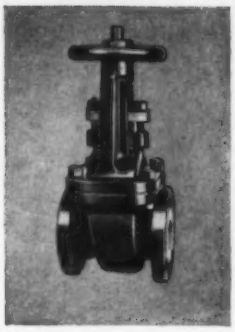
Sales representatives were: Bob Deggit, Joseph T. Ryerson & Son Steel Company; George Linder, American Coating Mills Company; and Carl Schulz, Armco Steel Corporation.

On the purchasing agents' side of the panel were: A. E. Gardner, U. S. Rubber Company; F. E. Kilander, South Bend Electric Company; C. B. Carpenter, Western Rubber Company.

TULSA ASSOCIATION HOLDS "PIPE LINE NIGHT"

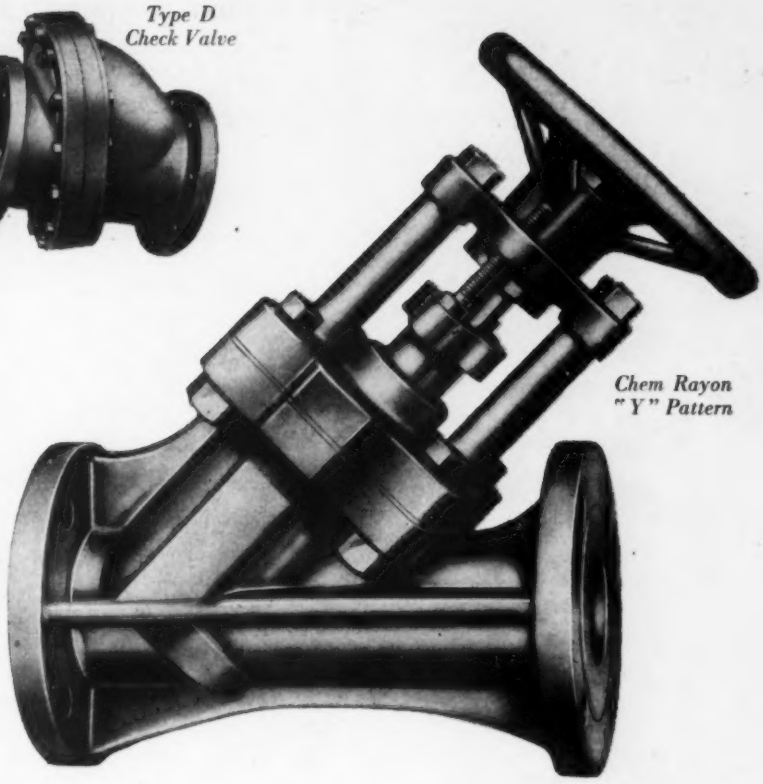
The "Pipe Line Night" meeting of the Purchasing Agents Association of Tulsa was held on January 10, in the Tulsa Building. J. L. Seger, executive vice-president of the Interstate Oil Pipe Line Company, Tulsa, was the guest speaker. Also on the program was the showing of the film "Highways for Oil".

(*Please turn to page* 242)



Wedge Type Gate Pattern

Type D Check Valve



Chem Rayon "Y" Pattern

Whenever you have problems of

ACID CONTROL

...make full use of NATIONAL Service

As these valves suggest, acid handling installations differ greatly in design and function. Because of this, it's often a real problem to choose the *right* type of control.

That's why it's good business...good engineering...to make full use of NATIONAL service when you have such problems.

What is this NATIONAL service?

It's service that brings you the widest sort of application know-how—know-how acquired by working with many different plants on many different processing problems...all over the country.

It's service that brings you the acid valve know-how of the leader in lead.

It's service that brings you "United" valves and "United Tubond" flanged pipe and fittings: built to render long, dependable service; designed to make the most of lead's inherent corrosion resistance. The lead used is "St. Joe Chemical."

It's service brought to you by an organization NATIONAL not only in name but also in scope—with strategically located plants and stocks that assure quick and economical handling of your valve, pipe, and fitting needs.

So...whatever your acid control problem, make full use of NATIONAL service.

Offices and Plants in Principal Cities: Pacific Coast: Morris P. Kirk & Son, Inc., Los Angeles; Canada: The Canada Metal Company, Ltd., Toronto.

Valves and fittings with a NATIONAL reputation

LEAD COMPANY

111 Broadway, New York 6, N.Y.

DARNELL CASTERS
& E-Z ROLL WHEELS

FLOOR

PROTECTION

• Save Money, Floors, Equipment and Time by using DARNELL Casters

Pre-tested for Performance

DARNELL CORP. LTD.
LONG BEACH 4, CALIFORNIA
60 WALKER ST., NEW YORK 13, N.Y.
36 N. CLINTON, CHICAGO 6, ILL.

RHODE ISLAND ASSOCIATION STARTS PURCHASING COURSE

A course in "Basic Purchasing Policies and Procedures" was begun in January by the Rhode Island Purchasing Agents Association, and will be carried on into early May. The course is open to members of the association and employees in their organizations.

The course is described as being designed to cover the fundamentals in purchasing policies and procedures and the organization and functions of a purchasing department.

Sessions are held at the Brown University Faculty Club. Charge for the course is $15.00. D. Francis Finn is chairman of the education committee.

KALAMAZOO ASSN. MEETS

A regular meeting of the Purchasing Agents Association of Kalamazoo was held at the Columbia Hotel on January 12. The program featured a commodity and trends discussion on "Futures Markets and the Availability of Supplies Over the First Quarter of 1950". F. L. Brown was chairman.

SYRACUSE & CENTRAL N. Y. ASSN. HEARS IBM EXPERT

An educational meeting of the Purchasing Agents Association of Syracuse and Central New York was held at the Onondaga Hotel, Syracuse, on Wednesday evening, January 25.

Principal speaker was A. R. MacAlmond, training director, International Business Machines Corporation, Endicott, N. Y. Mr. MacAlmond's subject was "Short Cuts to Office Efficiency".

A commodity discussion was also held, directed by J. M. Austin, chairman of the commodity committee.

GOVERNOR GUEST AT R. I. ASSOCIATION MEETING

A regular meeting of the Rhode Island Purchasing Agents Association was held on Monday, January 23, at the Narragansett Hotel, Providence. The meeting was designated "Governor's Night" and featured the appearance of John O. Pastore, chief executive of the state. Governor Pastore also addressed the group.

CEMENT FILM FEATURED AT CHATTANOOGA ASSN. MEETING

The regular monthly meeting of the Purchasing Agents Association of Chattanooga was held on January 10, at the Hotel Patten. Feature of the meeting was the showing of a film entitled "Drama of Portland Cement".

Educational chairman Ted Oldenburg reported that 22 members of the association had enrolled in the University of Tennessee extension course on Industrial Purchasing. The course is being paid for by the association and was scheduled to start at the end of January and run for 16 weeks.

PRODUCTION GOES UP!
COSTS GO DOWN!

when you protect your workers with OLYMPIC GLOVES

Steel ribbons, horizontally placed, reinforce all wearing surfaces of this rugged Olympic chrome leather gauntlet. (No. 330C). Special palm patch gives added protection without loss of flexibility . . . thumb reinforced with patch strap . . . 2 in. cuff protects wrist . . . glove entirely sewn with steel thread. These features, typical of the outstanding Olympic glove line, produce long-wearing qualities of low cost.

Remember—Olympic has a glove to fit every job!

FREE: *Special circular illustrating full line of finger protectors and illustrated catalog of safety work gloves and safety apparel sent to business organizations on request.*

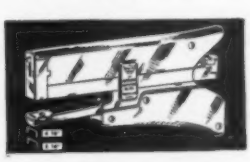
OLYMPIC GLOVE COMPANY Inc.
95 Madison Ave., Dept. 9, New York 16, N. Y.

STAPLE—to save time . . . speed up production

T-32 Gun Tacker

A many purpose tool replacing hammer and tacks at trigger rate speed. Shoots a staple wherever a tack can be driven. Heavy duty Tacker of all steel construction with chrome finish. Same machine takes a 3/16", 1/4" and 5/16" staple. Loads 150 staples. $8.50.

Rustproof "Monel" staples available.



P-22 Hand Stapler

A heavy duty industrial plier that "reaches into hard-to-get-at places". Same machine takes 1/4" and 5/16" staples. Loads 150 staples. $6.00.

Slightly higher in the West and Canada.

Buy from your local dealer or order direct — Dept. P.

ARROW FASTENER COMPANY, INC.
30-38 Maujer Street Bklyn. 6, New York

TUNE IN "SUSPENSE!"
CBS RADIO NETWORK THURSDAYS
CBS TELEVISION TUESDAYS

AUTO-LITE

DIE CASTINGS

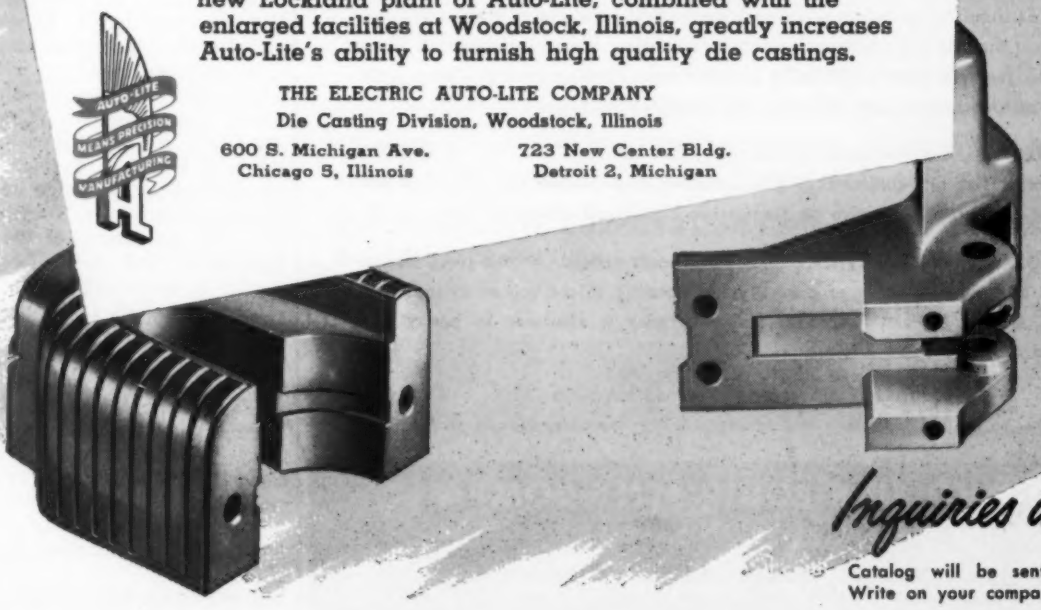
● Increased production facilities for die castings made possible through the famous Auto-Lite "controlled metals" processes are now available. The opening of the great new Lockland plant of Auto-Lite, combined with the enlarged facilities at Woodstock, Illinois, greatly increases Auto-Lite's ability to furnish high quality die castings.

AUTO-LITE MEANS PRECISION MANUFACTURING

THE ELECTRIC AUTO-LITE COMPANY
Die Casting Division, Woodstock, Illinois

600 S. Michigan Ave.
Chicago 5, Illinois

723 New Center Bldg.
Detroit 2, Michigan



Inquiries invited

Catalog will be sent on request.
Write on your company letterhead.

NEW!

C-O-TWO

DRY CHEMICAL TYPE
FIRE EXTINGUISHER

EXCLUSIVE DESIGN

assures you of fast, positive fire protection

SELF-CONTAINED UNIT . . . rugged construction . . . no extra gadgets protruding or complicated operating parts . . . one of the most efficient, foolproof, easy-to-use fire extinguishers known . . . two convenient sizes, 20 pound capacity and 30 pound capacity.

C-O-TWO DRY CHEMICAL STAYS FREE FLOWING . . . no syphon tubes or valves within the cylinder to become clogged or inoperative . . . discharge hose and squeeze type discharge nozzle remain empty until the fire extinguisher is actuated. Inverting the fire extinguisher before using provides mechanical breakage by changing the position of the dry chemical in the cylinder. Bumping to actuate the fire extinguisher provides additional mechanical breakage as well as continuous carbon dioxide gas pressured agitation or fluffing of the dry chemical. These combined features plus a skillfully blended free flowing extinguishing agent assure you of a faster, more effective and complete discharge.

APPROVED . . . Underwriters' Laboratories, Inc. rating is B-1, C-1. C-O-TWO Dry Chemical is non-conducting, non-corrosive, non-abrasive, non-freezing and non-toxic . . . highly effective on flammable liquid and electrical fires.

RECHARGEABLE ON-THE-SCENE . . . no special tools needed . . . one piece removable top assembly leaves large unobstructed opening in the top of cylinder for refilling. C-O-TWO Dry Chemical for recharging is available in handy pre-measured moisture proof containers.

Write today for complete free information on this new, quick-acting fire extinguisher . . . no obligation.

C-O-TWO FIRE EQUIPMENT COMPANY
NEWARK 1 • NEW JERSEY
Sales and Service in the Principal Cities of United States and Canada
AFFILIATED WITH PYRENE MANUFACTURING COMPANY

1950 EDITION OF ASME CODE FOR UNFIRED PRESSURE VESSELS

The 1950 edition of Section Eight of the ASME Boiler Construction Code covering rules for the construction of unfired pressure vessels has recently been published by The American Society of Mechanical Engineers. Compiled by the ASME Boiler Code Committee, H. B. Oatley, chairman, it embodies all the revisions in the code that have taken place since the 1946 edition.

The 1950 edition covers carbon and low-alloy steels only. The rules for non-ferrous metals, cast-iron and high alloy steels are now in preparation and will be added to the present volume. The stress tables are based on a safety factor of four instead of five as in the 1946 code. The 1950 code therefore allows the manufacturer more flexibility and cuts costs, permitting the construction of lighter vessels. With a table of contents (the 1946 code didn't have one) as well as an index, the new volume is arranged for easy reference and is more workable for designers and inspectors.

The ASME Unfired Pressure Vessel Code has now been adopted by 38 states, Canada, Hawaii, Puerto Rico and the Panama Canal Zone as well as many cities in non-code states in this country. It is available from the society, 29 West 39th Street, New York, N. Y., at $3.50

* * *

NEW HANDBOOK ON ELECTRICAL SUPPLY AND COMMUNICATION LINES

A new Handbook of the National Bureau of Standards, *Installation and Maintenance of Electric Supply and Communication Lines-Safety Rules and Discussion*, combines the code rules on electric lines (representing Part 2 of the National Electrical Safety Code, NBS Handbook H32), with the discussion thereof (Handbook H39). In addition, the Handbook includes three appendices which present certain technical data useful in making computations of the strengths of supporting structures and in determining crossing clearances. In some cases engineering short cuts are suggested which give approximately the same results as formulas covered in the code. Thus code rules, discussion, and related engineering data are now issued in a single volume for the convenience of design engineers, construction supervisors, linemen and others who use this section of the Code. This Handbook, H43, is available only from the U. S. Government Printing Office.

Handbook H43, *Installation and Maintenance of Electric Supply and Communication Lines-Safety Rules and Discussion*, 386 pages, 29 tables, 20 figures, available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., $1.50 a copy. Remittances from foreign countries must be made in United States exchange and must include an additional sum of one third the publication price to cover mailing costs.

(*Please turn to page* 246)

An Eccentric Problem Solved by a Simple Suggestion

This refrigerant pump eccentric shaft presented a real problem to engineers of one of America's leading refrigerator manufacturers. For units of ¼ H.P. and under, carbon steel met all machining and heat treating requirements without difficulty. On larger units, however, distortion encountered in hardening treatment resulted in excessive reject losses.

Upon the recommendation of a Republic Field Metallurgist, the manufacturer adopted Republic 8720-H Alloy Steel Cold Finished Bars for this application. The result: Machinability remained satisfactory . . . distortion troubles were overcome . . . reject losses were drastically reduced.

Perhaps you, too, have a troublesome problem for which alloy steel could provide the prompt, economical solution. Republic—world's largest producer of alloy and stainless steels—offers you this same field metallurgical service without cost or obligation. Write today.

REPUBLIC STEEL CORPORATION • Alloy Steel Division, Massillon, Ohio
General Offices, Cleveland 1, Ohio • Export Department: Chrysler Building, New York 17, N. Y.

Republic REPUBLIC STEEL **ALLOY STEELS**

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

LOWER PRICES

on EMERSON-ELECTRIC BELT-DRIVE

BALL-BEARING EXHAUST FANS

for Vertical or Horizontal Installation

Industrial installation of 48-inch Exhaust Fans, with automatic wall shutters.

Now is the time to head off "summer slump". . . combat fatigue and increase workers' efficiency with dependable Emerson-Electric Exhaust Fans. Substantial price reductions on the complete line of Belt-Drive, Ball-Bearing Exhaust Fans make proper ventilation an even better-paying proposition in 1950! Equipped with ball-bearing motors and special thrust shaft mountings, these powerful fans offer longer, quieter service, require less servicing, and may be mounted at any desired angle. Available in four blade sizes, 30″, 36″, 42″ and 48″, with capacities up to 19,350 CFM. Take advantage of Emerson-Electric's 60 years of ventilating equipment manufacturing experience. See your electrical contractor, or write for free Exhaust and Ventilating Bulletin No. 524.

DIRECT-DRIVE EXHAUST FANS

Available in 5 sizes, with blade sizes from 12 to 30 inches. Quiet-type overlapping blade assembly, fully-enclosed, ball- or sleeve-bearing motors.

THE EMERSON ELECTRIC MFG. CO St. Louis 21, Missouri

EMERSON ELECTRIC
MOTORS • FANS APPLIANCES

JUTE AND BURLAP CONDITION IN CONFUSION

Returning to New York from a six week on the spot observation of India's jute and burlap conditions affecting this country's supply, F. H. Rhoden, Chase Bag Company's manager of burlap purchasing, confirmed that previously reported confusion still exists.

Commenting briefly after a flight which took him around the world, Mr. Rhoden said the monetary disorder between the jute producing areas of Pakistan and the mills of Calcutta, brought about by the devaluation of English money, would continue to restrict free trading until settled.

As head of burlap purchases for Chase, Mr. Rhoden has made three trips to India in the interest of trade relations since the end of World War II. During the war he was chief of the Burlap and Soft Fibre Products Section of the War Production Board Civilian Production Administration in Washington and administrator of Burlap Conservation Order M-47.

BUSINESS TAX HANDBOOK

Lasser's Business Tax Handbook Third Edition has just been released by Simon & Schuster, Inc., Rockefeller Center, 1230 Sixth Avenue, New York, N. Y. This book by J. K. Lasser, Certified Public Accountant, Adjunct Professor of Taxation, Chairman on Federal Taxation, New York University, and author of several books on income tax, corporation tax, social security, various handbooks of accounting methods, and tax procedures, contains 792 pages, and is characterized as "The Standard Authoritative Guide to Business Operation and Taxes." It contains more than 10,000 money-saving ideas for "Your Business", "Your Employees", "Your Partners", "Your Corporation and Its Stockholders". It shows how to make business decisions throughout the year by showing how to:

"Operate a Business Tax-wisely for the Benefit of the Family;

"What Business Form to Use and how to Change——Merge—or Liquidate;

"How to Operate a Proprietorship or Partnership;

"How to Conduct a Corporation to Avoid Tax Difficulties;

"How to Do Business Abroad;

"How to Deal with Your Stockholders and Bondholders;

"How to Sell or Buy Business Property;

"How to Deal with Securities;

"How to Buy, Sell and Operate Real Estate;

"How to Pay Compensation to Employees;

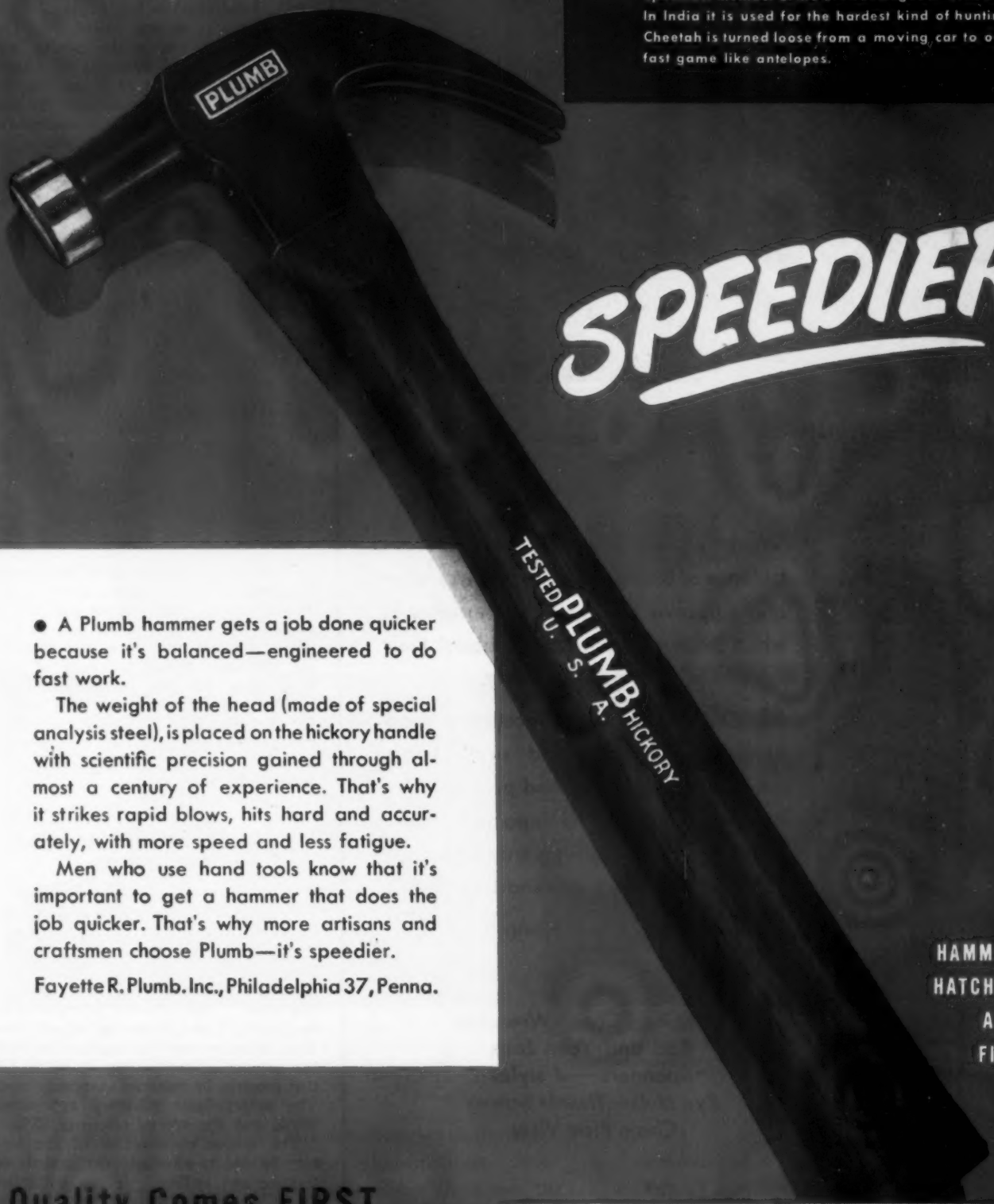
"Tax Accounting Methods and Elections to Reduce your Tax;

"How to Get Maximum Tax Advantages from Proper Planning of Business Expenses;"

Described as being a "Complete Guide to Business Operation and Taxes," the price of the box is $5.00 per copy.

Speediest member of the animal kingdom is the Cheetah. In India it is used for the hardest kind of hunting. The Cheetah is turned loose from a moving car to overtake fast game like antelopes.

SPEEDIER



● A Plumb hammer gets a job done quicker because it's balanced—engineered to do fast work.

The weight of the head (made of special analysis steel), is placed on the hickory handle with scientific precision gained through almost a century of experience. That's why it strikes rapid blows, hits hard and accurately, with more speed and less fatigue.

Men who use hand tools know that it's important to get a hammer that does the job quicker. That's why more artisans and craftsmen choose Plumb—it's speedier.

Fayette R. Plumb. Inc., Philadelphia 37, Penna.

HAMMERS
HATCHETS
AXES
FILES

Quality Comes FIRST

PLUMB

is FIRST in Quality

The black head with the red handle—exclusively **PLUMB**

PLUMB

Workmen quickly feel the perfect balance of Billings drop forged wrenches and approve the competent manner in which Billings shop tools go about their job of saving time and money.

The Billings line for '50 contains drop forged wrenches and shop tools designed, field tested and produced by men who know what is expected of fine tools. . . . The results—a tradition since 1869—is industry's dependable "buy".

In '50 be thrifty—buy Billings!

"Memory-joggers"

Genuine "Coes" Wrenches
Rod and Yoke Ends
Spanners — 4 styles
Eye Nuts—Thumb Screws
Chain Pipe Vises

BETTER BUY BILLINGS®

WRENCHES & SHOP TOOLS
FROM BILLINGS INDUSTRIAL SUPPLY DISTRIBUTORS

THE BILLINGS & SPENCER COMPANY, HARTFORD 1, CONNECTICUT, U.S.A.

NEW INTERCHANGEABLE RUBBER TYPE CUTS MARKING TIME

A stamping device that features interchangeable rubber type fitted into a unique tongue and groove arrangement is claimed to cut hours off marking and stamping operations.

The new invention, called Base-Lock Rubber Type, permits the user to interchange letters and numerals of different sizes and styles from 1/16" up. The type is locked in the base simply by the pressure of a finger, and aligns automatically. It does not slip or move out of line while printing. The maker states that it is adaptable to a wide selection of stamping devices and marking machines.

Two or more sizes of type can be used at the same time with the same holder. In one case, a manufacturer who had to mark his boxes with color, size, number of lot, amount and price, had required six different stamps for each of four men doing the job. Using Base-Lock, he is reported to need only four stamps for the operation.

Base-Lock is made by the Krengel Mfg. Co., Inc., 227 Fulton St., New York 7, N. Y.

* * *

SILVERCEL BATTERY PLACED ON THE MARKET

M. N. Yardeny, president of Yardeny International Corporations, 105 Chambers St., New York, N. Y., announces that initial commercial tests have proved that the silver cell storage battery now being manufactured on a pilot basis, is successful. The Silvercel is reported to by only 1/3 to 1/5 the weight of common batteries now in use, and in bulk the volume of the battery is ½ to 1/3 that required by batteries commonly used. The ampere-hour efficiency approaches 100%, and the energy efficiency 85%.

The unique construction of the battery is said to eliminate the hazards of leakage and spilling. It can withstand heavy discharges without any damage, and corrosive fumes are absent incident to charging or discharging cycles.

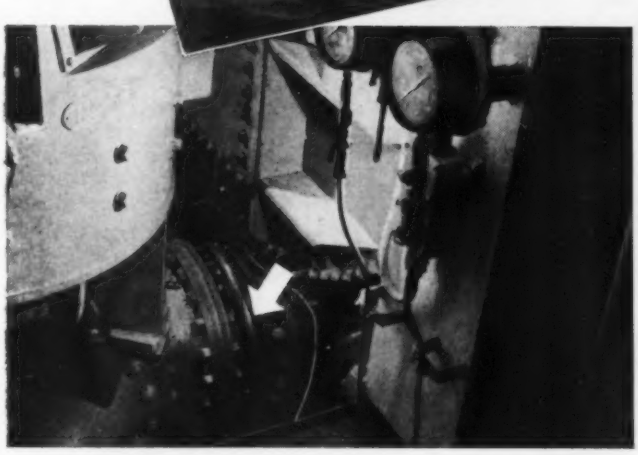
From the economy standpoint, the Silvercel is said to compare favorably, taking into consideration life, weight, number of cycles, etc., with all current storage cell batteries. Also, it is so

(*Please turn to page* 250)

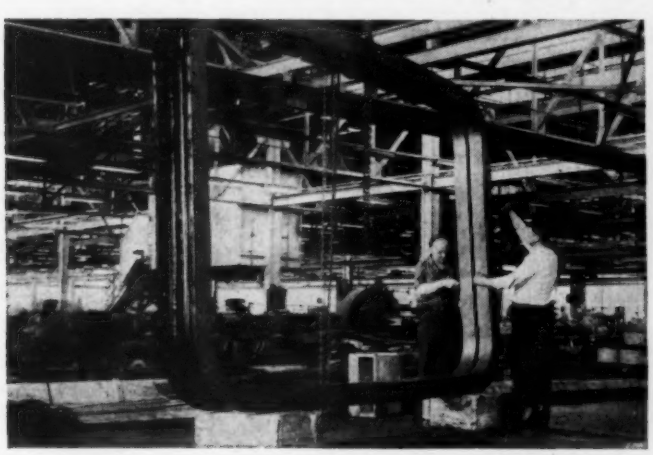
THE CASE OF THE NERVOUS SHIP

Vibrations and noise in her pipe systems eliminated by installation of U. S. Rubber expansion joints

FROM "SHIP-SHAKES" TO SHIPSHAPE was the case with this freighter, once a sufferer from throbbing pipes, unladylike rattles. Easily installed U. S. Rubber Expansion joints provided the cure.



A CASE IN POINT shows compact U. S. Rubber Expansion Joint between circulating water pump and ship's condenser. It allows maximum expansion and contraction in normal operations.



KINGSIZE JOINT was developed for use between turbine and condenser in central power stations. Only U. S. Rubber, the originator of rubber expansion joints, has built reliable joints as large as this.

United States Rubber Co. engineers can design and build joints to meet your special conditions... can make practical recommendations for their use to take care of expansion, vibration and elimination of noise transmission, and to provide resistance to fire. Write Mechanical Goods Division,

A PRODUCT OF

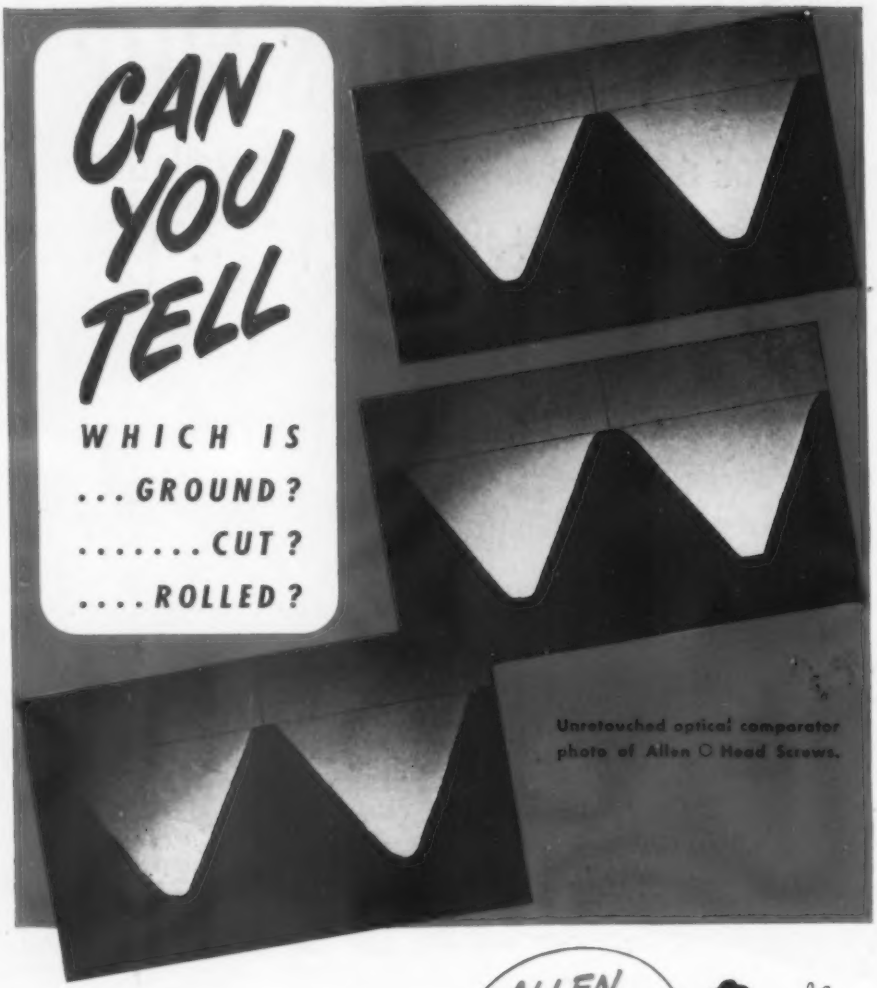
U.S.RUBBER

SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Want Additional Product Information? See Page 19.



Find it hard to decide? Don't waste your time because threading method is purely our problem. Your interest is in *Uniform Class 3 fit.* You get it every time when you specify Allen ⬡ Heads instead of just Allen-type screws.

We use all the accepted threading methods depending on the metal, the size and, in some cases, the application. We investigate every new development and incorporate the best into our manufacturing methods. Because we do not commit ourselves to any *one* method, we can give you the *extra* precision and uniformity that makes Allen ⬡ Heads fit smoothly and stay tight under the most gruelling service.

SOLD ONLY THROUGH LEADING DISTRIBUTORS

Write the factory direct for technical information and descriptive literature.

WARNING
Allen-Type screws aren't necessarily Allen-Made.
Get genuine Pressur-Formed Allen ⬡ Head screws in this black and silver box.

ALLEN ALLEN HEAD
MANUFACTURING COMPANY
Hartford 2, Connecticut, U. S. A.
NEW YORK, CLEVELAND, DETROIT, CHICAGO, LOS ANGELES

FOR 40 YEARS THE BUY-WORD FOR SOCKET SCREWS

(*Continued from page* 248)

light and so small that it makes an economical substitute for the dry cell.

Immediately available are five types of Silvercel batteries ranging from 0.5 to 40 ampere hour capacity. Large capacity batteries are in the development stage.

Its ruggedness and recharging potential makes extended use in place of the dry cell far less costly than present methods, it is claimed. The use of compact non-spill, high capacity silver cells in portable radios, television, photography instruments, etc., leads the way towards the solution of many design problems.

FULLER ADDS 100% NYLON BRUSHES TO PAINT BRUSH LINE

Announcement has recently been made by The Fuller Brush Company of 11 new 100% Nylon Paint Brushes to augment the company's present line of 100% pure bristle paint brushes.

It is claimed that the new nylon brushes will last four times as long as bristle brushes on all surfaces including rough ones such as concrete, brick, and structural steel. The new nylon filaments are said not to split, fray or become brittle, to be resistant to most chemicals, and to be unaffected by age or weather, rodents, insects and fungi. They can be used with all types of oil and water paints, synthetics, lacquers, kalsomines and enamels.

One of the the original objections to nylon paint brushes—tips too coarse for fine painting—has been overcome in the new Fuller nylon brushes by a special sanding process which softens the tips and improves capillary attraction so that paint is applied smoothly and evenly. With continued use the tips will maintain this taper. Scientific blending of different nylon lengths and diameters, plus the addition of some crimped filaments, increases the holding capacity of Fuller Nylon Paint Brushes.

Eight sizes of wall brushes, two stucco brushes and one kalsomine brush are available in the new line. Further information and descriptive literature may be obtained by writing to Industrial Division, The Fuller Brush Company, 3635 Main Street, Hartford 2, Connecticut.

(*Please turn to page* 252)

A Commodity? No! It's a Service that is bought by the carload!

NEW! AQUA-FLAKES

A Complete Liquid Adhesive — Dehydrated!

FOR

COMBINING · LAMINATING

HEADING AND WRAPPING

TUBE WINDING

FABRICATING MULTI-WALL BAGS

AQUA-FLAKES give you full control of adhesive quality. You simply add cool tap water to quickly dissolved **AQUA-FLAKES**. And you have a complete liquid adhesive—*with all of its original qualities*—ready-for-use. As easy as that!

Large quantity users of old-fashioned cold water solubles and cook-up dextrines can stop worrying about mistakes in mixing formulas . . . wasted batches . . . changing characteristics during heating, cooling, storing . . . evaporation and pasting-up . . . mixing, aging and storage costs, etc. Quality-controlled **AQUA-FLAKES** film beautifully, tack fast, provide excellent coverage—and reduce preparation and production costs.

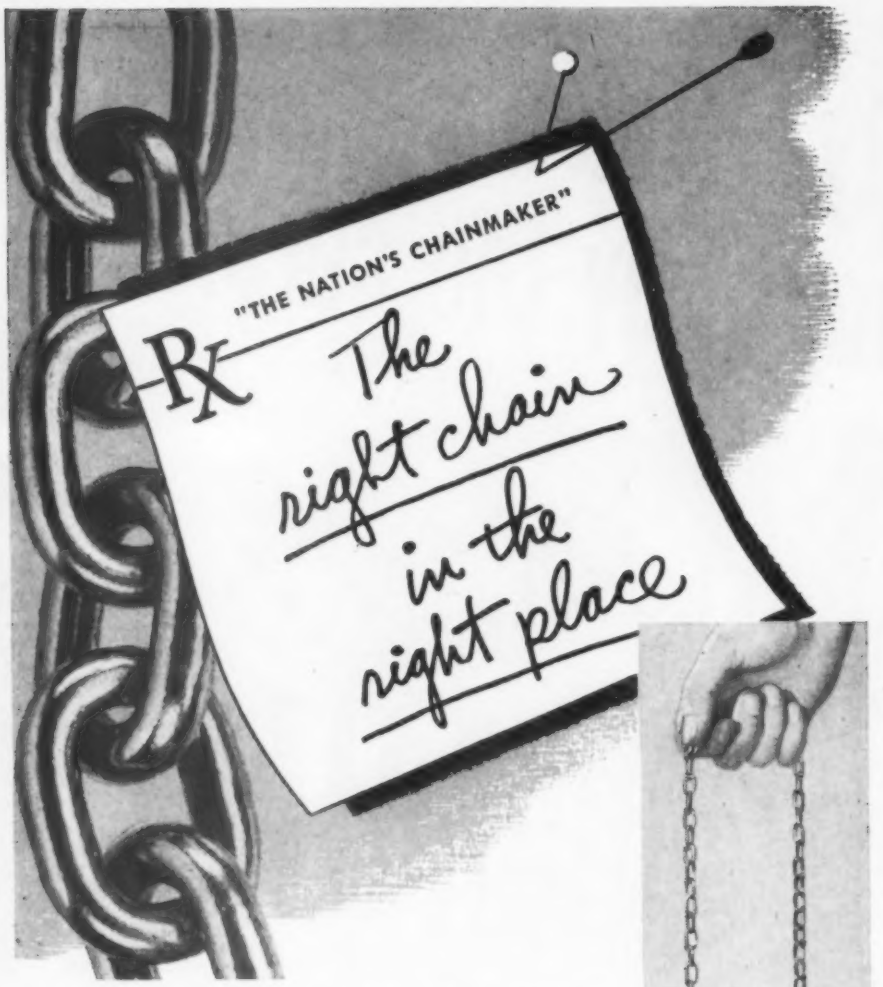
How are **AQUA-FLAKES** made? A new National process removes the water from a fine liquid dextrine adhesive without impairing its high quality. All you have to do is — put the water back.

Skeptical? A demonstration in your plant under actual working conditions will amaze you!

National ADHESIVES

Address: 270 Madison Ave., NEW YORK 16; 3641 So. Washtenaw Ave., CHICAGO 32; 735 Battery St., SAN FRANCISCO 11, and other principal cities. In CANADA: National Adhesives (Canada), Ltd., TORONTO and MONTREAL. In ENGLAND: National Adhesives, Ltd., SLOUGH.

ONLY THE TAP WATER HAS BEEN REMOVED ● ONLY THE TAP WATER HAS TO BE REPLACED



Here at York, we do not think of chain-making as merely a matter of producing tonnage. To offer a line of products as complete as the AMERICAN CHAIN line requires an intimate knowledge of chain design, the best use of alloys, proper heat-treating, galvanizing—plus the necessary machinery and equipment to take full advantage of that knowledge.

AMERICAN makes chain in sizes from that of a ship's anchor chain to that of a fish stringer. But size is only part of the story. A wide selection of patterns, material analyses and finishes—as well as a complete range of fittings and attachments—makes AMERICAN truly the

"COMPLETE CHAIN LINE"

York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN

ACCO

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

REHABILITATION PROGRAMS TO HIGHLIGHT 1950 INDUSTRIAL BUILDING MARKET

Organized efforts to reduce production costs will result in an unusually large volume of plant modernization and rehabilitation in many segments of industry during 1950, Otto F. Sieder, Executive Vice President and General Manager of The H. K. Ferguson Company, industrial engineers and builders, said recently in the firm's annual forecast based on a survey of Ferguson representatives in major industrial communities across the country.

Construction volume in the industrial field seems certain to decline—possibly as much as 15 per cent. This decline would be even more if large expenditures by the government for atomic and military facilities were not considered part of the total industrial volume.

On the other hand, the Ferguson survey discloses that engineering volume will hold firm, and may even increase over 1949 figures. Two reasons are advanced for this optimism:

1) Modernization and rehabilitation programs usually require greater engineering expenditures per dollar of construction than new plants; and

2) Comparatively few plants were on the drawing boards in 1949. More are expected to be planned and engineered in 1950. Those will not go into actual construction this year, however, since engineering is generally a year or more ahead of building.

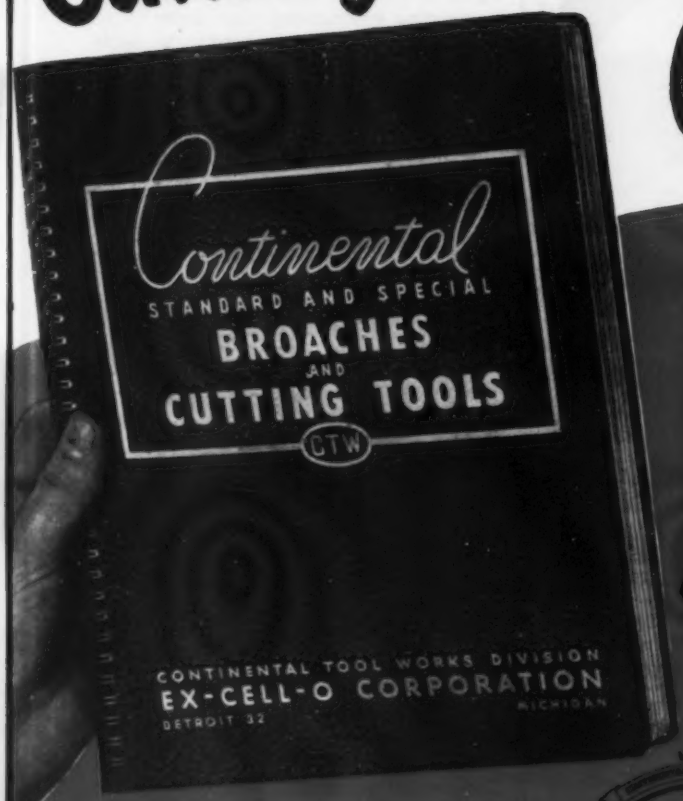
"The new year will reflect a pronounced search for operating economies through better design, modernized processes and integrated layout," Mr. Sieder said. "Increasingly tighter competitive conditions and advancing production costs in nearly all phases of industrial endeavor are becoming major problems for most manufacturers. Many of them are realizing that the starting point to lower production costs is a soundly engineered plant."

Studies by The Ferguson Company indicate that many modernization programs, especially in the chemical and process industries, will involve moderately large dollar expenditures. Typical programs will consist of the installation of labor saving devices such as automatic control instruments, advanced materials handling systems, and the replacement of piping systems, tanks, electrical systems and other major items of equipment which have been in constant use to fill a decade of war and post war demands. A large amount of building repairs and replacements is also necessary in many instances due to lack of proper upkeep during the past ten years.

Mr. Sieder pointed out that many modernization programs will take a spectacular turn because it is sometimes more economical to construct an entirely new plant than to rehabilitate an existing facility to the desired degree of efficiency. An effort to reduce materials handling costs, for example, could conceivably result in the abandonment of a multi-story structure in favor of a single story build-

(*Please turn to page* 254)

Cutting Tools—and More Cutting Tools!



The Complete CONTINENTAL Line is Described in This NEW Catalog— *Yours for the Asking!*

- STANDARD AND SPECIAL TOOLS
- BROACHES AND FIXTURES
- EASY TO USE
- COLORFUL, DURABLE
- FULLY ILLUSTRATED
- USEFUL TABLES AND CHARTS

• Cutting tools and broaches made by the Continental Tool Works Division of Ex-Cell-O are illustrated and described in a catalog just off the press. This new catalog lists all Continental Standard Cutting Tools, shows scores of special tools and contains a complete broach section fully illustrated. It's a colorful and attractive catalog with a durable cover. Many pages of useful information and charts are included for ready reference.

Ask your Ex-Cell-O representative for a copy now, or fill in and mail the coupon below.

CONTINENTAL TOOL WORKS

DIVISION OF EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

Ex-Cell-O Corporation • Continental Tool Works Division
1200 Oakman Boulevard • Detroit 32, Michigan

Please send me Catalog 60681 on Continental Cutting Tools and Broaches.

NAME_____

COMPANY_____

POSITION_____

STREET ADDRESS_____

CITY_____ ZONE____ STATE_____

50-4

CANVAS
G.H.Q.
BEMIS

Need canvas in any form...covers, bags, yardage? Small or large amounts? Standard or special designs? Then you will benefit by making Bemis your Canvas General Headquarters.

All Bemis canvas products are *good products*...and you'll profit still further by having a single source for all of your requirements. Write, wire or phone us for detailed information.

Bemis
623 S. Fourth St., St. Louis 2, Mo.

ELECTRIC WHEELS
Designed to do the Job

Wheels and Axles are our business, and our engineers are well qualified to recommend the most efficient assembly for your product.

Our factory is modern and tooled for low cost production. We have supplied manufacturers in many different industries for more than 50 years.

Standard or Special, ELECTRIC Spoke-type or Disc Wheels are built for most types of portable equipment.

Send us your specifications and we will submit our recommendations.

ELECTRIC WHEEL CO., 2913 Pine, Quincy, Ill.

(*Continued from page 252*)

ing. In fact, there are already instances where this has been done profitably. In the chemical industry, where technological advances are sometimes likely to make existing processes obsolete almost overnight, it may be advantageous to scrap an existing process and start anew.

Ferguson district managers in all parts of the United States believe that costs will be relatively stable during the year, although "full impact of rising steel prices is yet to be felt." Prior to these increases, a slight drop in costs, not to exceed two or three per cent, had been anticipated.

Several factors were said to be working in favor of lower costs. First is that competition and abundance of supply is bringing down the cost of certain building materials. Second is that productivity from labor is on an upward swing. A third is that deliveries for most items are again predictable and enable builders to schedule their operations more effectively than in the past several years.

The absence of the "haste element" is also conducive to reduced building costs, according to the Ferguson study. Manufacturers are allowing their projects to remain in the planning stage much longer and more time is allowed for economical buying. Generally, more time is allowed for actual construction.

Additional points in the annual forecast:

The backlog of wartime industrial buildings for sale by the War Assets Administration is practically depleted. Numerous companies which otherwise would have bought these structures at reduced prices—often at the expense of economical operation——will have to expand their own plants.

Many large corporations are building modern distribution facilities on a nationwide basis. Some have programs calling for a dozen or more warehouses and assembly plants. One reason for decentralization is that freight rates have risen to the point where they are now a major item of cost.

MANDREL-BONDED SILICONE RUBBER AND FIBERGLAS SLEEVES & GASKETS

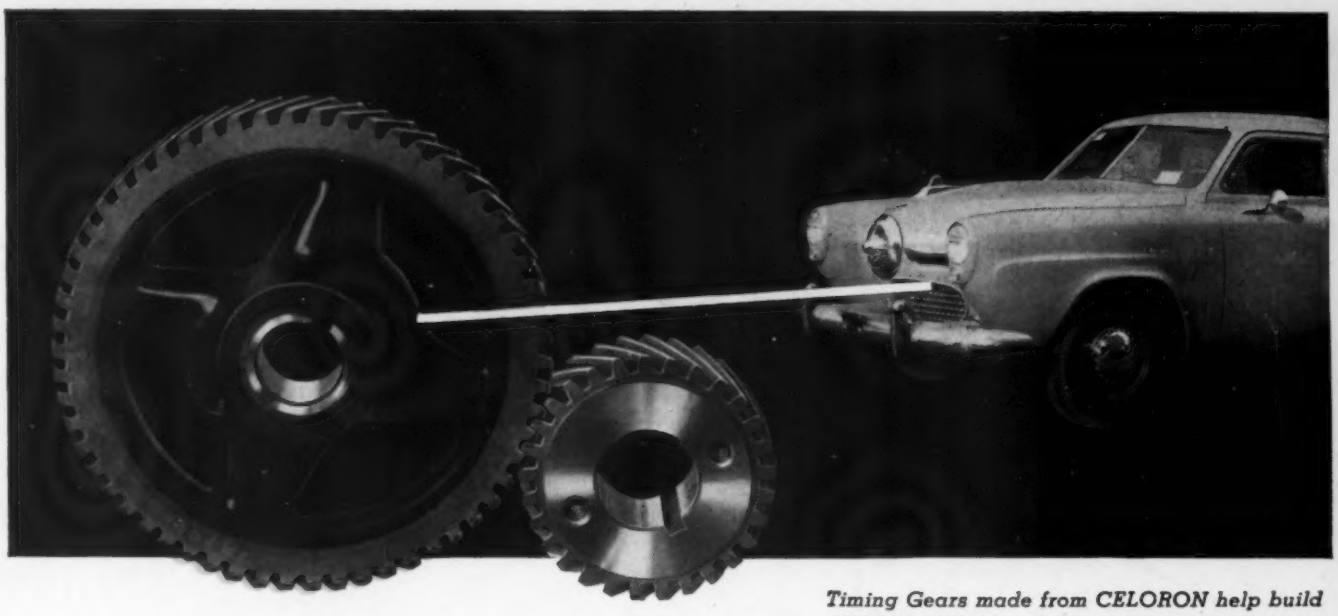
Development of a new process which facilitates bonding of Silicone rubber and Fiberglas by means of mandrel-curing to produce sleeves and gaskets was recently announced by The Stalwart Rubber Company, Bedford, Ohio. The new sleeves are available in sizes ranging from ¼-inch inside diameter to those having a 5½-inch outside diameter and wall thicknesses range from 1/16 to 1-inch. Sleeves can be supplied in lengths up to 3 feet.

Prior bonds of Silicone rubber and Fiberglas have been made by means of sheet lamination and strengths produced in this manner only increased the tear resistance. Mandrel-bonded Silicone rubber and Fiberglas sleeves and gaskets now have increased strength both laterally

(*Please turn to page 256*)

CELORON

. . . what's in it for you and your products?



Timing Gears made from CELORON help build STUDEBAKER'S reputation for dependability.

What's in CELORON for you . . . and your products? This different thermo-setting plastic maintains strength and resiliency at temperatures up to 290°F. Resists oil, water and many corrosive chemicals. It is 1/6 the weight of steel—only 1/2 the weight of aluminum! Remarkably easy to machine, Continental-Diamond's CELORON gives you an unusual combination of light weight, high strength, and wear resistance *plus* electrical insulating properties.

CELORON is another example why it pays to see C-D first in your search for the right plastic. For plastics that provide *practical* combinations of mechanical and electrical properties, call your nearest C-D office. Trained technicians on hand at all times to help with your material selection problems.

CELORON—ideal for many mechanical and electrical applications

Specific Gravity	1.35	Impact Strength (Izod) (per inch of notch)	2.3 Ft. Lbs.
Tensile Strength	6,500 psi	Brinell Hardness—500 kg. load	38
Flexural Strength	10,000 psi	(10 mm diameter ball—30 seconds)	
Compression Strength	25,000 psi	Rockwell Hardness	M105
Shearing Strength	8,500 psi		

your partner in producing better products

DE-1-50

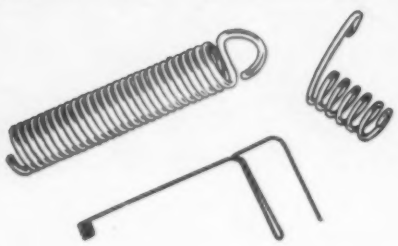
BRANCH OFFICES: NEW YORK 17 • CLEVELAND 14 • CHICAGO 11 • SPARTANBURG, S. C. • SALES OFFICES IN PRINCIPAL CITIES
WEST COAST REPRESENTATIVE: MARWOOD LTD., SAN FRANCISCO 3 • IN CANADA: DIAMOND STATE FIBRE CO. OF CANADA, LTD., TORONTO 8

Continental-Diamond FIBRE COMPANY

Established 1895. . Manufacturers of Laminated Plastics since 1911—NEWARK 41 • DELAWARE

"Springs are Springs"

maybe so
for most people
... but NOT
for ACCURATE



HOW often have you heard a spring user or even a manufacturer say "Springs are springs, what difference who makes them if the price is right?" Here at Accurate, we think it makes a big difference and our experience proves it. *Exact* conformance to specifications can be mighty important if it means easier, faster assembly and better performance for your product. Quality control is important, too, when it saves you time and trouble. "Know-how" and facilities for making springs the least costly way can mean many dollars for you.

It all adds up to lower overall spring costs for you and that's what we at Accurate have to sell. Before you place your next spring order we would like to show you what it means to you in particular. There's no obligation; write today.

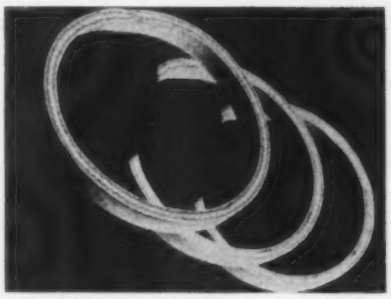
Accurate Springs

COST CONSCIOUS QUALITY
Since 1930
ACCURATE SPRING MFG. CO.
3825 W. Lake St. • Chicago 24, Ill.
Springs, Wire Forms, Stampings

(*Continued from page* 254)

and horizontally, and they are suitable for installations involving high pressures as well as high temperatures.

Flexible Silicone rubber sleeves are recommended for applications requiring the transmission of hot or corrosive gases, super-cooled liquids at temperatures ranging from —110 to more than 400 degrees Fahrenheit. In addition, they will not crack, become brittle and will not deteriorate after long exposure to air, ultra violet rays and ozone.



Mandrel bonded sleeves and gaskets of silicone rubber and Fiberglas

Excellent dielectric properties of Silicone make it particularly applicable for electrical installations.

Silicone rubber can be mandrel-bonded to asbestos, Nylon and cotton. Bonds of these materials are recommended for lower temperature and pressure applications.

NEW TOOL STEEL ANNOUNCED BY ALLEGHENY LUDLUM

Allegheny Ludlum Steel Corporation announces the development and availability of a new tool steel, specifically designed for hot work.

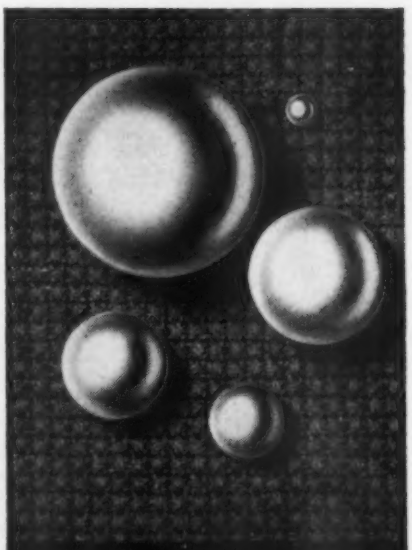
Marketed under the name B-47 Hot Work Steel, the new alloy is a combination of chromium, tungsten, cobalt, vanadium and iron which has proved in extensive laboratory and field tests to have excellent resistance to shock and abrasion at elevated temperatures. Although its good hot hardness permits the alloy to do any number of severe hot work jobs without washing out or changing size, it is specifically recommended for applications which require good toughness at relatively high hardness, or where abrasion resistance and resistance to heat checking are important factors.

Allegheny Ludlum recommends the new product for such applications as brass extrusion dummy blocks and dies, valve extrusion die inserts, forging die inserts, forging press dies and hot punch tools.

The new steel is a product of the company's tool steel research laboratory at Dunkirk, N. Y. It was in the developmental stage for about two years, having been subjected, along with five other experimental alloys, to severe laboratory and field experiments. B-47 more than stood its ground, not only in competition with the other experimental alloys but with established tool steels as well.

(*Please turn to page* 258)

a metal ball PROBLEM?



Let STROM Work It Out For You

Whether it is a precision ball bearing or one of the other many ball applications in industry, your problem will not be entirely new. Strom has been in on many ball problems and knows the importance of the right ball for the job.

Strom has been making precision metal balls for over 25 years for all industry and can be a big help to you in selecting the right ball for any of your requirements. In size and spherical accuracy, perfection of surface, uniformity, and dependable physical quality, there's not a better ball made.

Strom
STEEL BALL CO.
1850 So. 54th Ave., Cicero 50, Ill.
Largest Independent and Exclusive Metal Ball Manufacturer

SECONDARY OPERATIONS
Cost Less at Alcoa!

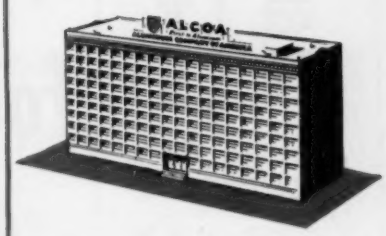
Secondary operations can make the difference between out-of-line costs or reasonable prices for screw machine products. Because they can cost you *more than primary operations* unless your screw machine supplier takes them into account at the outset.

Alcoa does just that—engineers the whole job at the start. Takes advantage of equipment specially selected for low-cost secondary work on aluminum and magnesium. Drilling, tapping, slotting, milling, press forming, stamping or marking, thread rolling, centerless grinding, and others.

That's why you can buy the best light metal screw machine parts from Alcoa *at prices no greater—possibly lower—than you've been paying for run-of-the-mill work.*

For a prompt quotation on your job, *phone* your nearby Alcoa sales office. ALUMINUM COMPANY OF AMERICA, 2130B Gulf Building, Pittsburgh 19, Pennsylvania.

ONLY ALCOA OFFERS YOU ALL THESE UNDER ONE ROOF—



MEN trained specifically in machining aluminum and magnesium alloys.

MACHINES handling all types of rod, bar and tubing up to 3½" O.D.—from hand machines to multiple spindle automatics.

SECONDARY OPERATIONS—Burring, drilling, tapping, milling, slotting, press forming, stamping, marking, centerless grinding, thread rolling, others.

FINISHING—Tumbling, burnishing, chemical dip, oiling, buffing, color buffing, plain or colored Alumilite* finishing.

FINISH QUALITY CONTROL—Laboratory check of Alumilite finishes; regular production checking, final visual inspection.

CONTINUOUS INSPECTION by operators as well as inspectors. Begins with first piece inspection, continued by operator equipped with all necessary gages; process and final inspection employing statistical methods.

BIG STOCK INVENTORY that is adequate to initiate most jobs without waiting for mill shipment of stock.

DESIGN AID that can give you a better product or lower costs, or both. New orders are analyzed by Alcoa engineers for improvements or cost reduction.

ASSEMBLY AND PACKAGING—Alcoa is set up to turn out parts, finish, assemble, package and ship completed products (not necessarily all-aluminum) ready for immediate resale.

MACHINED FORGINGS, CASTINGS, IMPACT EXTRUSIONS—Gives you the advantages of one source for these parts and secondary operations on them.

LOW COST, FAST DELIVERY—Alcoa offers you all these at competitive prices and dependable delivery schedules.

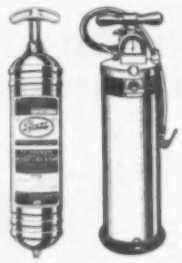
*Patented Process

ALCOA ALUMINUM SCREW MACHINE PRODUCTS

ALCOA ALUMINUM

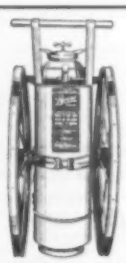
INGOT • SHEET & PLATE • SHAPES, ROLLED & EXTRUDED • WIRE • ROD • BAR • TUBING • PIPE • SAND, DIE & PERMANENT-MOLD CASTINGS • FORGINGS • IMPACT EXTRUSIONS
ELECTRICAL CONDUCTORS • SCREW MACHINE PRODUCTS • FABRICATED PRODUCTS • FASTENERS • FOIL • ALUMINUM PIGMENTS • MAGNESIUM PRODUCTS

Want Additional Product Information? See Page 19.



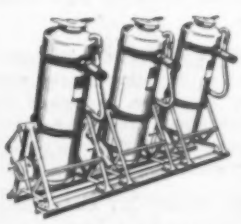
VAPORIZING LIQUID

The all-purpose extinguisher effective on almost every kind of fire. Safe on electrical fires, too. 1 qt. and 1½ qt. pump types; 2 qt. and 1 gal. pressure-operated types.



CHEMICAL FOAM

2½ gal. size produces about 22 gals. of fast-acting foam. Ideal for flammable liquid and ordinary combustible hazards. Also in 10 gal. and 40 gal. (above) wheeled units.



MANUAL AND AUTOMATIC SYSTEMS

Complete fire-fighting systems, using chemical foam or air foam. For storage tanks, dip tanks, loading racks, etc.

CARTRIDGE-OPERATED

Eliminates annual recharging. For fires in wood, paper, textiles, etc. Shoots water or antifreeze solution. 2½ gal. size.

ALSO AIR FOAM, SODA-ACID, PUMP TANK, AND OTHER EXTINGUISHERS

Get the RIGHT Pyrenes for the RIGHT places

• Buy them the reliable, prompt, economical, easy way — from your local PYRENE jobber.

Not all fire hazards are the same. That's why PYRENE* builds a fire extinguisher for *every kind* of hazard. You can buy them all from one source of supply—your local jobber. That way, you get immediate delivery, you pay no freight charges, and you deal with an established business right in your own community.

Whether it's a hand extinguisher or automatic system, every PYRENE is precision-made for *sure* protection. PYRENE is a name you can trust, a product you can always rely on. Write for address of your local PYRENE jobber.

*T.M. Reg. U.S. Pat. Off.

Pyrene FIRE EXTINGUISHERS

PYRENE MANUFACTURING COMPANY

578 Belmont Avenue Newark 8, New Jersey

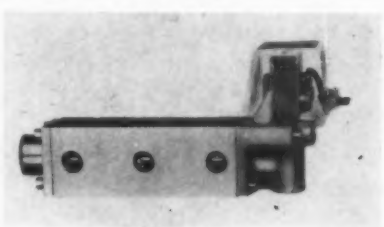
Affiliated with C-O-Two Fire Equipment Co.

(*Continued from page 256*)

Laboratory reports showed that the new metal has excellent hot hardness and very good resistance to wash. Field tests showed, for instance, that the alloy outperformed low carbon high speed steel two to one for punching axe eyes. For extrusion of brass and copper it outperformed standard alloys as much as three to one.

SINGLE PLUNGER VALVE EMPLOYS SMALL SOLENOID

A solenoid piloted operated single plunger valve which employs a small solenoid, assuring faster action and reducing current requirements, impact and maintenance, has been introduced by C. B. Hunt & Son, Inc., Salem, Ohio. Known as the type "SA" line, the new valves employ a small solenoid travelling through only an ⅛" stroke to move a small pilot valve plunger to apply air to the operating piston to move the main valve plunger. When the solenoid is de-energized, the pilot cylinder is exhausted through the small pilot valve, permitting the main plunger to return due to the bucking cylinder pressure on the opposite end. The design is said to assure positive performance and a much greater operating force than is possible with a large direct connected solenoid.



The new solenoid piloted operated single plunger valve employs a small solenoid, assuring faster action

The reduced amperage requirement of the small short stroke solenoid permits operation with standard types of pilot switches, avoiding intermediate relays and simplifying the electric control circuits. Since the solenoid plunger and small pilot cylinder weigh only a few ounces and have very short travel, the valves can be operated at very high speeds at normal air pressures. The valve is furnished in 2-way, 3-way, 4-way, 5-way designs; ⅜", ½", ¾" and 1" sizes. Air to 200 psi; oil or water to 250 psi. Data sheet giving full details available on request.

WESTERN SOFTWOOD PLYWOOD COMMERCIAL STANDARD

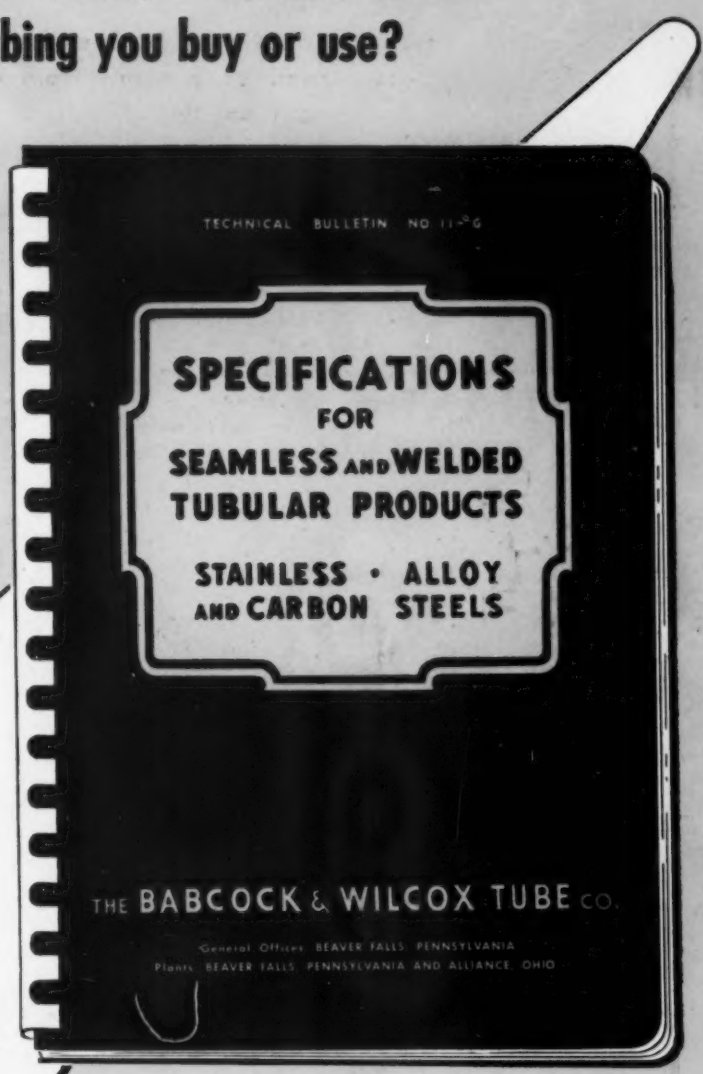
Western Softwood Plywood Commercial Standard CS122-49 (second edition) became effective for new production from December 20, 1949, according to the Commodity Standards Division of the National Bureau of Standards, Washington, D. C. Copies will be available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. in due course.

DO YOU KNOW

the complete requirements for

ANALYSES—MECHANICAL PROPERTIES—TOLERANCES INSPECTION AND TESTING PROCEDURES of the steel tubing you buy or use?

If you specify or buy carbon, alloy or stainless steel tubing, B&W's Technical Bulletin 11-G will undoubtedly be of value to you as all the above details are presented. This 234-page book contains the latest revisions of 48 ASTM, ASME, AAR and B&W specifications for seamless and welded steel tubing as produced in B&W's tube mills.



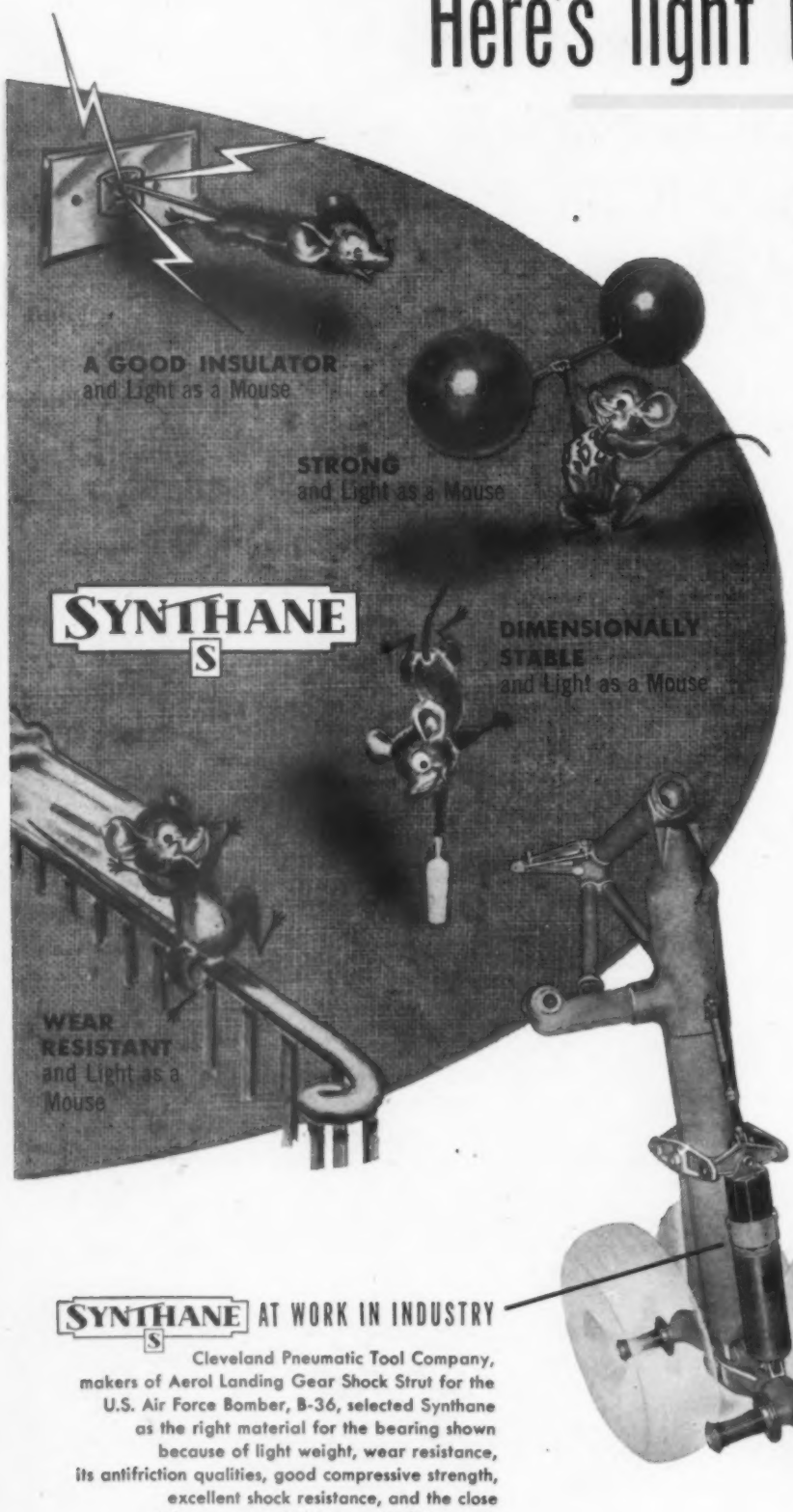
A copy will be sent to you upon receipt of a request on your company letterhead. Write to:

The Babcock & Wilcox Tube Company

Beaver Falls, Pennsylvania

B&W SEAMLESS and WELDED TUBES

Here's light weight and much



SYNTHANE is half the weight of aluminum. Moving parts made from this type of laminated plastics start faster, require less power to start, stop and run . . . and light weight is only *one* of the Synthane properties that make it a valuable material for you.

With Synthane you get light weight, strength, resistance to wear, dimensional stability and excellent electrical insulation, plus many other desirable mechanical, electrical and chemical characteristics.

This unusual *combination* of properties has led to the use of Synthane in thousands of applications in almost every industry. It may be the material you have been seeking to help make a good product better or a process less expensive.

Electrical qualities such as high dielectric strength, low power factor and low dielectric constant, together with light weight and moisture resistance have helped put Synthane in television sets, transformers and many other pieces of electrical and electronic equipment.

Hard, dense and abrasion resistant, yet easy to machine, Synthane is a widely used material for long-wearing, high-speed gears, cams and rubbing blocks.

And so it goes in application after application —Synthane pays for itself in extra advantages over other materials. It may be helpful to you.

If you have a specific material problem, write us outlining the situation. We will be glad to help with material, design, or fabrication of finished parts.

Synthane Corporation,
Oaks, Pennsylvania.

SYNTHANE AT WORK IN INDUSTRY

Cleveland Pneumatic Tool Company, makers of Aerol Landing Gear Shock Strut for the U.S. Air Force Bomber, B-36, selected Synthane as the right material for the bearing shown because of light weight, wear resistance, its antifriction qualities, good compressive strength, excellent shock resistance, and the close tolerances to which it may be fabricated. Are these qualities valuable to you?

PLASTICS WHERE PLASTICS BELONG

MATERIALS • DESIGN • FABRICATION • SHEETS • RODS • TUBES

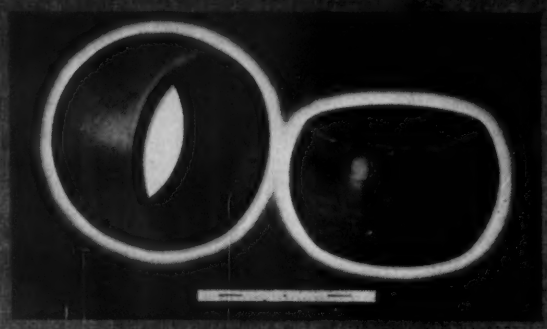
more in a material

Here

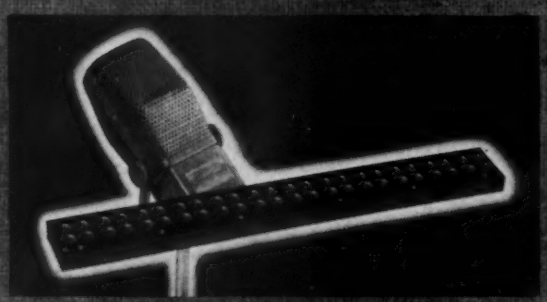
ARE YOUR ADDED VALUES

Synthane was the material selected for each of the four parts shown at the right. Each manufacturer sought one or two specific characteristics. In each application the user found that Synthane was not only a better material for the major requirement but gave him other desirable properties. This is true of almost every application, for Synthane is unusual for its *combination* of properties.

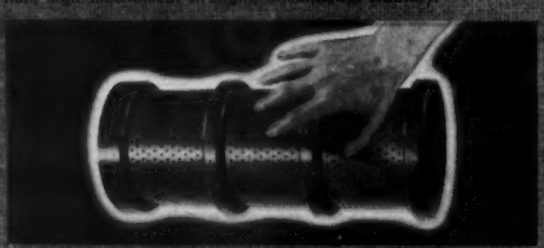
Synthane is strong, hard, light and dense. Resists abrasion, corrosion, is easily worked on standard machine tools. It is an excellent electrical insulator, has high dielectric strength, low dielectric constant and low power factor. It is a *set* plastic, dimensionally stable over a wide range of temperatures.



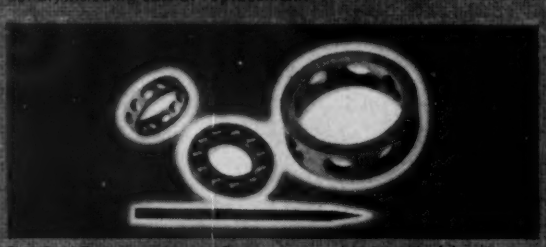
Knuckle Bearing for Rock Crusher. Manufacturer required good antifriction qualities. In addition, Synthane gave him excellent mechanical strength, dimensional stability, wear resistance.



Jack Panel for Radio Control Console. Insulating ability was needed. The extra values obtained were low moisture absorption, high mechanical strength, dimensional stability.



Plating Barrel. Major requirement was corrosion resistance. The manufacturer found that Synthane also gave him abrasion resistance, mechanical strength, light weight and longer life per dollar, including cost of replacement.



Bearing Retainer Rings. Production problems called for dimensional stability. Synthane delivered many extras, including mechanical strength, light weight, corrosion resistance, abrasion resistance, and low inertia.

If these few of Synthane's many desirable properties and abilities suggests its use in your product or process, clip and mail the coupon today.

SYNTHANE CORPORATION
7 River Road, Oaks, Pa.

Gentlemen:

Please send me, without obligation, the complete catalog on Synthane Technical Plastics.

*Name*_____

*Company*_____

*Address*_____

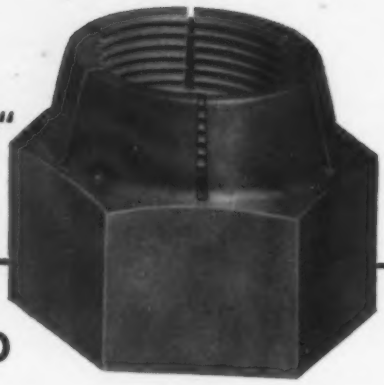
*City*_____ *Zone*_____ *State*_____

SYNTHANE

WHERE SYNTHANE BELONGS

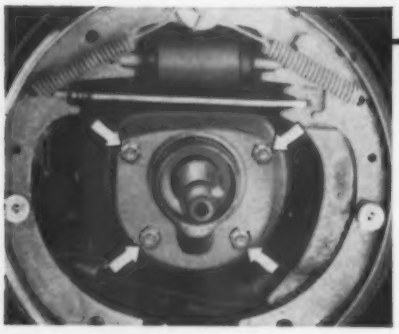
MOLDED-LAMINATED • MOLDED-MACERATED

NAT SAYS:
These "Huglocks" are the nuts to . . .



WITHSTAND

SHOCK-LOADING OR VIBRATION



Huglocks on rear brake backing plate

Huglocks used to fasten differential carrier to rear axle housing

The HUGLOCK is a one-piece, all-metal, self-locking nut designed for use wherever shock-loading or vibration is a problem . . . even under heat, oil or moisture conditions. (See typical applications shown.)

HUGLOCK is just one of the "National" family of lock nuts, designed to fit every fastening need . . . for stress, shear, shock or vibration . . . for heavy or lightweight materials.

Other "National" Lock Nuts include: MARSDEN—for effective locking at minimum cost. DRAKE — for rugged, heavy equipment where severe stress, shock or vibration must be overcome. DYNAMIC — for lightweight, low-clearance locking in shear.

To help you select the right Lock Nut for your assembly, write for this Lock Nut booklet . . . giving engineering, design, and weight data.

National
HEADED AND THREADED
PRODUCTS

THE NATIONAL SCREW & MFG. COMPANY . . . CLEVELAND 4, OHIO

WESTINGHOUSE ANNOUNCES TWO COMPARTMENT WATER COOLERS

Two new 3-Temp., compartment-type water coolers—a bottle and pressure bubbler model—for use in private or executive offices, board rooms, lawyers' and doctors' offices, and other locations have been introduced by the Westinghouse Electric Appliance Division, East Springfield, Mass.

Both coolers provide 50 degree drinking water for 25 to 30 persons; a 35-38 degree refrigerated storage for food, beverages, or pharmaceuticals; and a freezing unit which produces three-and-a-half pounds of ice cubes at one freezing. As many as 40 half-pint bottles of milk or 29 beverage bottles can be kept in the stainless steel storage compartment at one time.

Bubbler Model Compartment Type Water Cooler

A newly-developed "Magi-Trol" control enables the new coolers to maintain the three desired temperatures in the water cooling chamber, freezer and refrigerated space independently of each other. Regardless of the load or heavy duty placed on any one of the three compartments, the desired temperature is maintained in each.

The coolers are also provided with a full-hinged door and lock-type, snap catch. As with all Westinghouse water coolers, the new 3-Temp units are equipped with an hermetically sealed refrigeration system backed by a five-year guarantee.

Further information is available from the Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

SPEED BAKE WHITE SYNTHETIC COATING FOR REFLECTING SURFACES

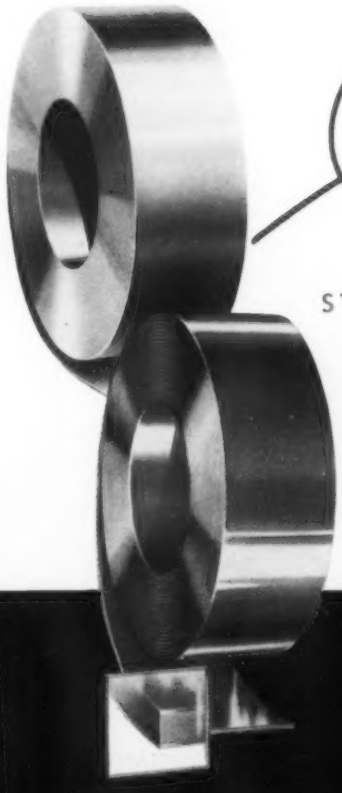
Bulletin issued by the Merrimac Division of the Monsanto Chemical Company, Boston, Mass., describes the development of a speed bake white synthetic for reflecting surfaces of lighting fixtures. Advantages claimed for the new coating include improved durability, color retention, reflectivity and chemical resistance. A high quality finish is economically obtained by a single coat application and a short baking cycle, according to the bulletin.

Finer
STRIP STEELS FOR YOU IN *1950!*

OVER 50 YEARS OF

Specialization

IN STRIP STEELS



STAINLESS

SPRING STEELS

CLAD METALS

ALLOYS

Specialization, in the fundamental Superior way, extends throughout our plant facilities, our research and our manufacturing techniques . . . to the sole end of producing finer strip steels for our customers. Our new plant installations, —including the Hot Mill shown above, cold rolling mills, and strip handling and storing facilities—signify faster, better service over a wider market range. • Let us detail the benefits to *you* of Superior specialization!

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

PERSONALITIES *in the* NEWS

Irving A. Duffy, Director of Purchasing for the Ford Motor Company, Dearborn, Mich., has been elected a Vice President and member of the policy committee.

Irving A. Duffy

Mr. Duffy will continue to serve as a member of the staff of D. S. Harder, Vice President—Manufacturing.

Prior to coming to Ford in February 1949 as Director of Purchasing, Mr. Duffy had served as assistant to the Vice President at International Harvester, directing coordination of the postwar expansion program in both plant and equipment. In 1947, he was appointed Director of Wage Administration for the farm equipment concern.

Mr. Duffy is a graduate of the United States Military Academy, and received his law degree from Columbia University. After passing the New York State bar in 1938 he was ordered to Washington in the Judge Advocate General's Department and was immediately assigned to the industrial mobilization program. For the following two years he worked with the staff of the War Department in developing legislation pertaining to industrial mobilization and followed the proposals through Congress.

In 1940, Mr. Duffy was assigned to the Ordnance Department of the Army to help in the creation of large special purpose ordnance plants. He was directly concerned with purchasing and procurement policies of the department, which were later widely copied in Army procurement generally.

During the war Mr. Duffy served both as chief of the legal division of the Ordnance Department and as special assistant to the Chief of Ordnance. He retired from the Army in 1946 with the rank of Colonel.

Jack Bornstein has been appointed Purchasing Agent, and Clarence L. Kessler Assistant Purchasing Agent for the Scintilla Magneto Division of the Bendix Aviation Corp., Sidney, N. Y.

A. E. Conn has been appointed General Purchasing Agent of the Ford Motor Company, Dearborn, Mich.

Mr. Conn has been with the Ford organization for the past 30 years, and in purchasing work since 1925. In 1948 he was named Assistant General Purchasing Agent for Ford. His organization will be responsible for purchasing production parts and materials, service parts and accessories, and non-production materials for the Ford Division.

G. P. Smith has been appointed Purchasing Agent of the Machinery Division of

G. P. Smith

the Dravo Corporation, Pittsburgh, Pa. He succeeds John K. Beidler, who has been named Assistant General Manager.

F. J. Koegler, Executive Vice President of the Doehler-Jarvis Corporation, New York, N. Y., is acting as Director of Purchases for the company following the retirement, because of ill health, of Phil L. Fett, General Purchasing Agent.

Robert A. Bower, who has been serving as Assistant General Purchasing Agent has assumed responsibility for the details of the purchasing department.

Ivor D. Sims has been appointed Purchasing Agent of Bethlehem Steel Company, Bethlehem, Pa.

Ivor D. Sims

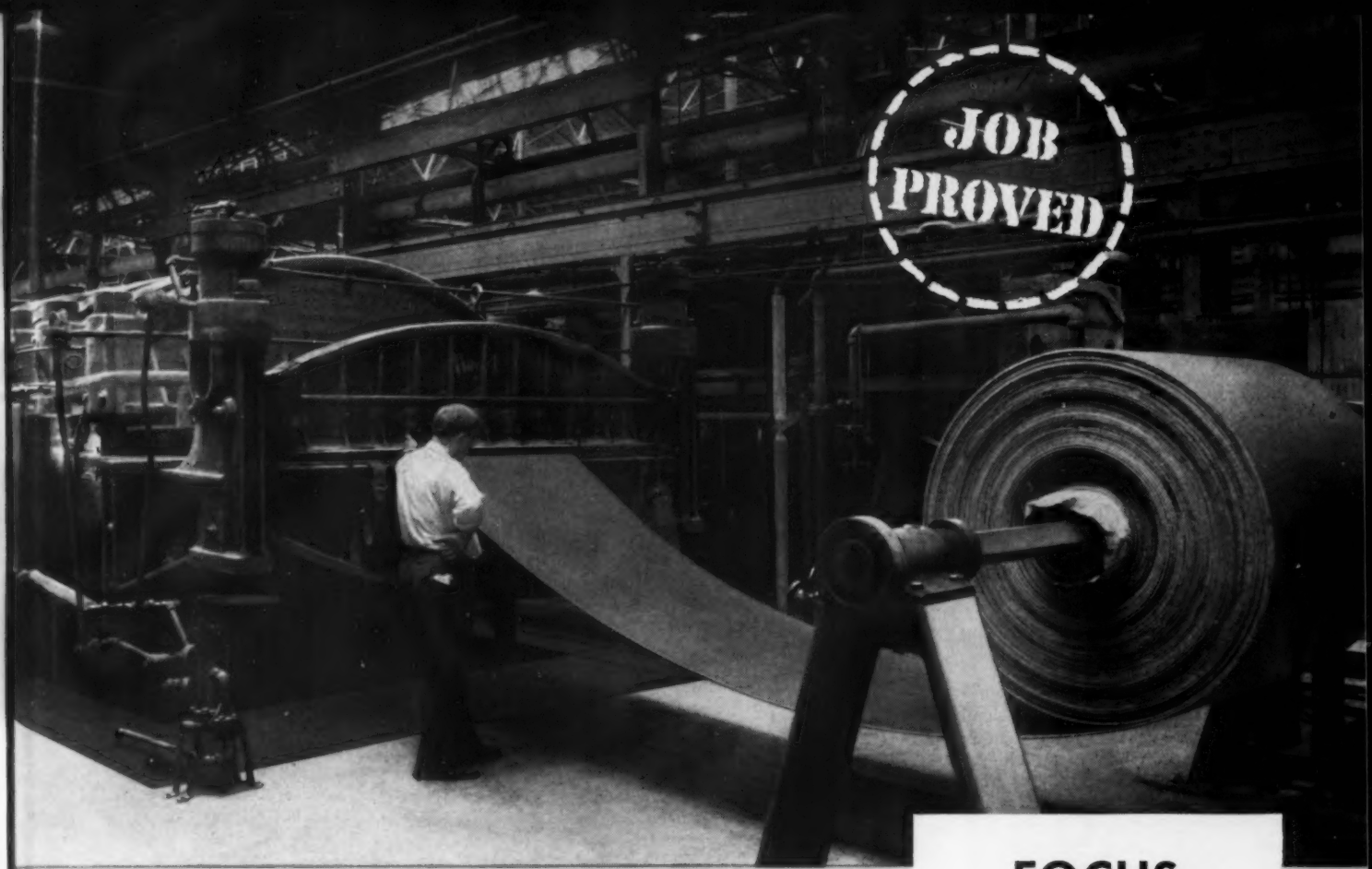
Mr. Sims graduated from Lehigh University in 1933 and joined Bethlehem the first year as junior buyer. He was advanced to buyer in 1939, and in 1944, to Assistant Purchasing Agent.

Woodrow W. Oliver has been named Assistant Purchasing Agent for the eastern district headquarters of American Steel & Wire Co., Worcester, Mass., according to an announcement by Frank E. Chesney, Purchasing Agent of the company. Mr. Oliver will serve as assistant to T. M. Haddock, eastern district Purchasing Agent.

Mr. Oliver started with American Steel & Wire as an office boy in the purchasing department in 1934. Several years later he became a clerk in the same department, and since then has held a succession of purchasing assignments. He became a buyer in 1945 and has served in that capacity since.

Colonel Robert A. Howard, Jr., is acting Commanding Officer of the New York Quartermaster Procurement Agency, New York, N. Y. Colonel Howard is in command pending the arrival of the new commander of the agency, Brigadier General Howard L. Peckham. General Peckham will succeed Brigadier General Letcher O. Grice, who has been named Commanding General of the Jeffersonville (Indiana) Quartermaster Depot.

(*Please turn to page* 266)



$6,000 A YEAR INVENTORY SAVING

Quality of Products Also Improved by Change in Rubber-Processing Aids

What to do when competition turns on the heat? Reduce costs and step up quality, of course. Easy to say, tough to do. The trick was turned, however, by one of the rubber industry's Big-Four producers of transmission and conveyor belting.

The manufacturer believed room for improvement lay in the variety and quality of oils he was using to process rubber for the big belts. For advice, he called in a Sun Oil Company representative, who suggested tests with two "Job Proved" Sun rubber-processing aids. Results indicated that Circosol-2XH in natural and GR-S stocks, and Circo Light Rubber-Processing Aid in neoprene and other synthetics, would mean easier processing and more durable belting.

For verification, small-scale production batches were prepared with the help of the Sun man. These bore out laboratory findings conclusively. Later, field reports revealed that belts made with Sun processing aids gave increased service. Circosol-2XH and Circo Light Rubber-Processing Aid completely replaced the five oils previously used. With inventory problems greatly simplified, the Sun man urged the manufacturer to install bulk oil-storage facilities. This done, quantity purchasing saved an estimated $6,000 a year.

For help on lubrication, processing or combustion problems, call the nearest Sun Office. No obligation, of course.

SUN OIL COMPANY • *Philadelphia 3, Pa.*
In Canada: Sun Oil Company, Ltd.
Toronto and Montreal

FOCUS

A problem isn't recognized as a problem until it is brought into focus. Inventories, for example, are low until someone demonstrates a way to keep them lower. Quality is fine until someone—maybe the competition—discovers a way to improve it. Costs are under control until someone points the way to worth-while savings. Time and time again Sun field men, with their broad industrial experience, have proved their ability to bring processing and lubrication problems into focus and make constructive recommendations to manufacturers.

SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY

SUNOCO®

Alvin A. Borgading, former Vice President in Charge of Purchases for American Car and Foundry Company, has announced the organization of Alborg Supply and Equipment Company, manufacturers' representatives specializing in industrial purchasing services for the railroad, oil production, refining and marine construction fields. Mr. Borgading will serve as president of the new company, with offices at 50 Church Street, New York 7, N. Y.

Alvin A. Borgading

As representatives of major manufacturers of transportation, petroleum, and shipbuilding equipment, the Alborg organization will provide purchasing and supply facilities, together with engineering counsel, covering a variety of basic requirements of heavy industry.

Mr. Borgading had a 42-year career with ACF, rising from office boy to Vice President. He had been Vice President since 1943.

John V. Moran has been named City Purchasing Agent of Boston, Mass. by Mayor John B. Hynes.

Mr. Moran a former agent of the Federal Bureau of Investigation, and president of the Medical Credit Bureau, is a practicing attorney. He is a graduate of Notre Dame University and Boston College Law School.

Eugene L. O'Meara has been appointed Purchasing Agent of Harbison-Walker Refractories Co., Pittsburgh, Pa.

Mr. O'Meara has been with Harbison-Walker since 1928, and has served for

Eugene L. O'Meara

several years in both the sales and construction divisions of the company's engineering department. He is a graduate of Carnegie Institute of Technology.

Carl Parker, former Assistant Revenue Commissioner, has been named as State Purchasing Agent of Arkansas, with headquarters at Little Rock, Ark.

P. T. Peterson, Purchasing Agent of the State of Minnesota, St. Paul, Minn., was recently elected president of the National Association of State Purchasing Agents at the group's meeting in Houston, Tex.

J. K. Vanatta has been appointed Purchasing Agent of Nekoosa-Edwards Paper Company, Port Edwards, Wis., in addition to his responsibilities of directing scheduling and planning. He succeeds R. S. Holcomb, who has resigned.

Mr. Vanatta joined the company in 1927 as an industrial engineer, and served as Purchasing Agent in 1931-32. During the next four years he was paper development engineer in charge of developing special sheets. In 1938 he was placed in charge of production scheduling of paper and pulp for both Nepco mills. Since 1946 he has directed production scheduling, plus materials handling and planning. He is a graduate of the University of California with a degree in mechanical engineering.

John. H. Stark, a 24-year veteran of the petroleum and aviation industries has been named Staff Superintendent-Petroleum Products for United Air Lines, Chicago 38, Ill., according to an announcement by D. V. O'Leary, Director of Purchasing and Stores.

John H. Stark

In his newly created position, Mr. Stark will supervise negotiation and purchase of all petroleum products and facilities used by the airline.

Mr. Stark joined the airline in 1946, and was a member of the traffic and sales division at the time of his present appointment. Before coming with United he had been Chicago district traffic and sales manager for Braniff International Airways. His oil industry experience includes operation of his own oil business, salesman with Pennzoil, general manager for Fred X., Inc., Chicago, and assistant zone merchandising manager for Sinclair Refining Company.

John Goodall has been appointed Purchasing Agent for Heller Brothers Company, Newark, N. J.

Russell McVicker has been named Vice President in Charge of Purchasing of the Chillicothe Paper Company, Chillicothe, O.

Donald A. Fruland has been elected Director of Purchases and Assistant Treasurer of Thermoid Company. Trenton, N. J. Mr. Fruland joined the company in 1947. Emil J. Houser has been appointed Assistant Purchasing Agent.

AMONG THE COMPANIES YOU BUY FROM

Louisville, Ky.—General Box Company. The company's Chicago and Louisville sales territories have been consolidated, with headquartess here. George T. Walne,

George T. Walne

vice-president, is transferred from Chicago to Louisville in charge of sales for the combined territories.

Pittsburgh, Pa.—Westinghouse Electric Corporation. John E. Payne has been named manager of Westinghouse's Central District.

St. Louis, Mo. — Midwest Piping & Supply Company, Inc. Phil R. Becker has been appointed sales manager of the welding fittings division of the company. He has been with the company for ten years, and since 1945 has devoted his entire time to sales in the welding fittings division.

Chicago, Ill.—Morse Chain Co., division of Borg-Warner Corp. Robert G. Holmes has been appointed branch manager of the company's sales office here.

New Britain, Conn. — Stanley Electric Tools, division of The Stanley Works. S. H. Cross has been named general man-

S. H. Cross

ager of Stanley Electric Tools. He succeeds Lucius M. Knouse, who has retired after 46 years with the company.

Wallington, N. J.—Tube Reducing Corporation. L. A. Karg has been appointed sales manager. He was formerly with Timken Roller Bearing Company.

(*Please turn to page* 270)

Kimpak* Float Packaging

SANDWICH TABLE
Menasha Woodenware Corp.

Combination Wrap. Delicate electronic tube. Photo courtesy of Gordos Corp., Newark, New Jersey.

Absorbent Packaging. Highly perishable Orchids. Photo courtesy of Beall Greenhouse Company, Vashon, Washington.

Cuts shipping costs — reduces damage in transit!

Regardless of your present packaging methods—it will pay you to investigate KIMPAK* Float Packaging. For *every* manufacturer switching to KIMPAK does so to save on shipping costs, reduce damage to his product in transit!

KIMPAK creped wadding is light, clean, pleasant to handle. Unlike bulk packaging materials, it's as easy to apply as wrapping paper. Yet no other cushioning material provides comparable safety with so little bulk or weight.

You'll find, too, that smart-looking KIMPAK "dresses up" your product, and does away with the usual litter in unwrapping. In a variety of specifications, this most modern of all packaging materials is used for protecting everything from glassware, furniture and appliances to chemicals, food and flowers. In fact, there is a specification of KIMPAK to meet every requirement of the Four Basic Methods of Interior Packaging—Bracing and Blocking, Flotation Packaging, Surface Protection, Absorbent Packaging.

For information, refer to your classified telephone directory under "Packing Materials" or "Packing Materials—Shipping;" or write directly to Kimberly-Clark Corporation, Neenah, Wisconsin.

FREE BOOKLET!

KIMBERLY-CLARK CORPORATION
Neenah, Wisconsin P-250

Please send me free, the illustrated KIMPAK Booklet, "Float Packaging."

Name _____

Firm _____

Address _____

City _____ *Zone* _____ *State* _____

Kimpak

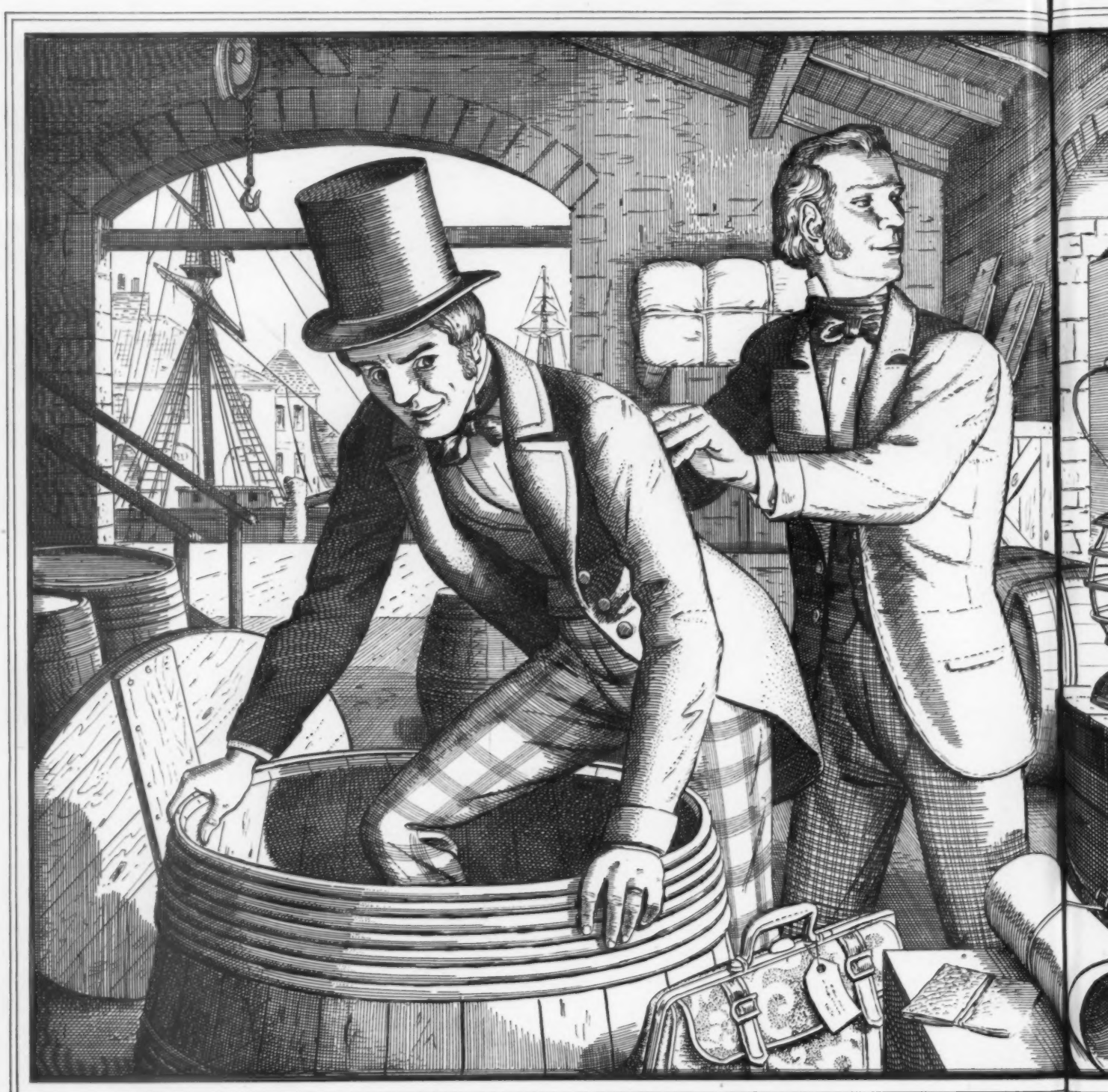
REG. U.S. PAT. OFF. & FOREIGN COUNTRIES

A PRODUCT OF Kimberly Clark RESEARCH

CREPED WADDING

*T. M. REG. U. S. PAT. OFF.

BUILDERS OF THE



One Hundred Years of BRASS made

BRASS INDUSTRY

ISRAEL HOLMES

(*First President of* BRISTOL BRASS)

Loud laugher at British police . . . Smuggler of men . . .
Shrewd taker of chances . . . Free thinker and enterpriser . . .
Organizer of 7 companies . . . Brass man first and last

Hard of head and fist, Israel Holmes became the first president of The Bristol Brass and Clock Company on the night of April 3, 1850, when the company was organized at Foster's Tavern, in the North Village of Bristol, Connecticut . . . then as now the Detroit of the clock industry. Then, Fillmore had just succeeded Zach Taylor. California had just been admitted by the Clay Compromise. And a country lawyer, name of Lincoln, was beginning to attract notice.

Organized with 16 directors, and capitalized for $100,000 to make clock brass and springs, Bristol never made a clock . . . but made one of industry's most phenomenal dividend-records. For Brass was the basis of the new clock industry. It didn't swell like wood in the humid heat of the south. Nor did it rust like iron. And it was mighty easy to work.

In that day, money was down and prices were up, as they are now. And copper was 20¼ cents a pound. But Israel Holmes clearly saw the gold in brass. So he went to Liverpool to bring Brass-casters and workers to this country . . . if he couldn't get them out of England any other way, *he smuggled them aboard ship in wine casks* under the noses of Liverpool police. And the Brass industry thrived in the Valley of the Naugatuck.

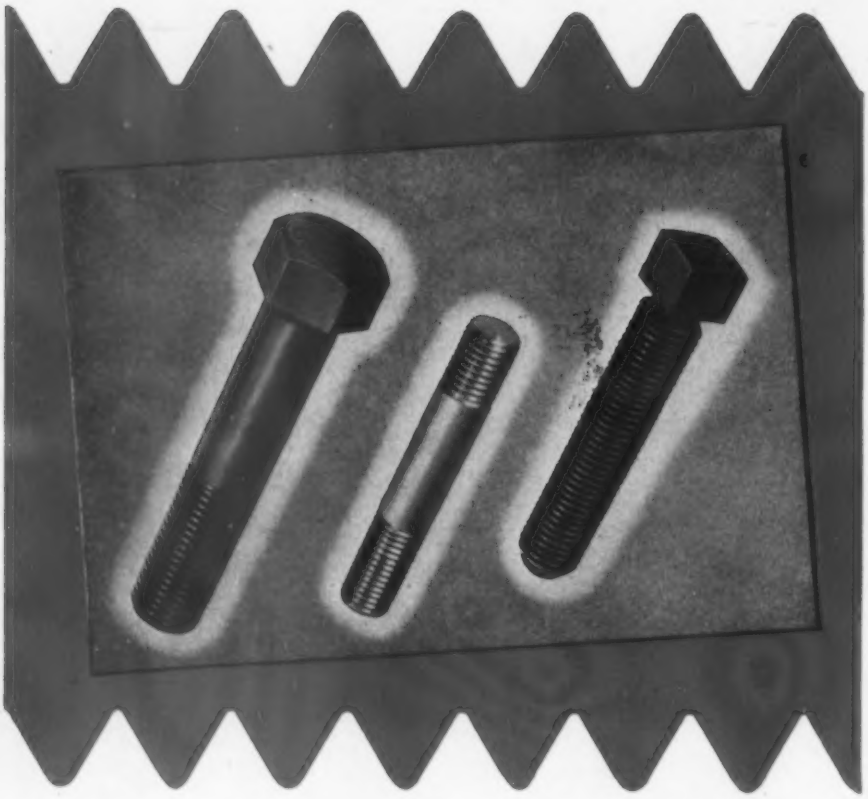
And Bristol Brass and Clock prospered more than most. For even then, Bristol Brass had already earned the name it still holds, 100 years later . . . for making Brass *fast*, making it *good*, and getting it to the customer when it had been *promised* him. That's how Bristol played such a large part in "giving everybody the time of day" . . . at a price they could afford. And *you*, whatever *your* product, can try Bristol Brass Sheet, Rod and Wire today . . . and get better quality and service than ever before.

"BRISTOL FASHION"

LIKE THE WORLD-FAMED MERCHANT SHIPS FROM BRISTOL, ENGLAND . . .
ALWAYS PROMPT, SHIPSHAPE, RELIABLE

The BRISTOL BRASS CORPORATION, *makers of Brass in Bristol, Conn. since 1850*

Want Additional Product Information? See Page 19.



Your *EXTRA* Advantages in specifying CLEVELAND Fasteners:

Extra high manufacturing standards,
Extra wide range of sizes,
Extra fast delivery

. . . advantages that spring from

CLEVELAND'S SPECIALIZATION

in Cap Screws* Set Screws, Milled Studs

*Cap Screws in Hex, Fillister, Flat and Socket Heads

Also special headed and threaded parts, your design.

Write for the monthly Stock List

THE CLEVELAND CAP SCREW COMPANY
2917 EAST 79TH STREET • CLEVELAND 4, OHIO
Warehouses: Chicago, New York, Philadelphia

CLEVELAND *Top Quality* **FASTENERS**

ORIGINATORS OF THE
KAUFMAN DOUBLE EXTRUSION PROCESS
Specialists for more than 30 years in
CAP SCREWS, SET SCREWS, MILLED STUDS
Ask your jobber for Cleveland Fasteners

Midland, Mich.—The Dow Chemical Company. A. R. Tucker, Jr., has been named head of Styrofoam sales, in the company's plastics division.

Oakland, Calif.—Towmotor Corporation. A new factory sales and service branch has been opened here at 4th and Castro Streets. Gordon Winters is in charge of the office.

Albuquerque, N. M.—Automatic Control Company. Lou Hoffman, P.O. Box 1516, has been appointed New Mexico area representative.

Cleveland, O.—G. Rider Neff has been appointed manufacturers' agent for the Rockford Screw Products Company of Rockford, Ill., and the General Hardware Company of Milwaukee, Wis. The name

G. Rider Neff

of the agency is G. Rider Neff and Associates, at 2917 Prospect Avenue. Mr. Neff was formerly vice-president in charge of sales of the Cleveland Cap Screw Company.

Richmond, Va.—Air Reduction Company. The Richmond Welding Supply Co. has been appointed dealer of Airco products.

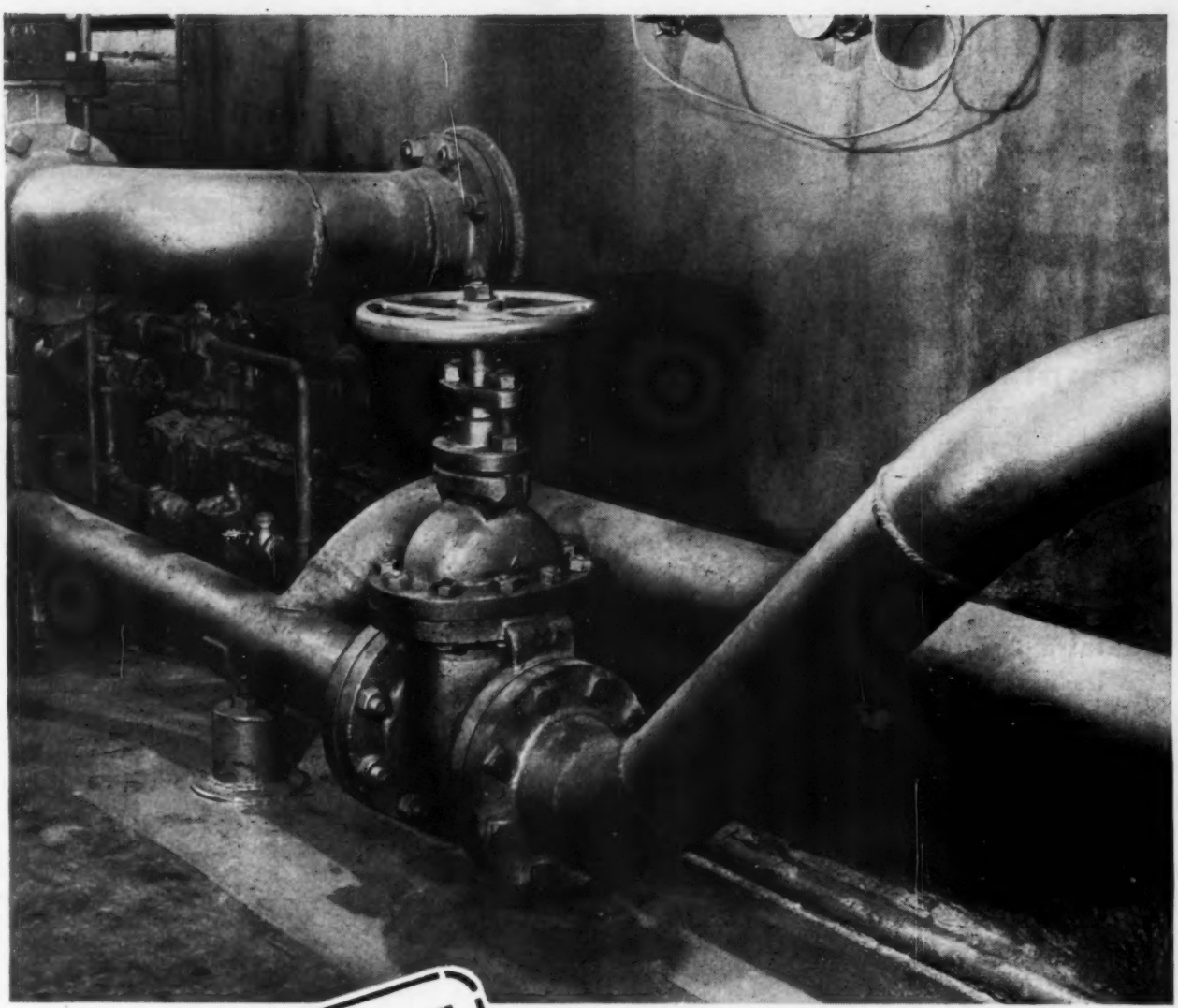
New Haven, Conn.—Henry G. Thompson & Son Company. John J. MacDonald has joined the sales staff of the company, and will cover the New England states as a manufacturer's direct representative. Mr. MacDonald formerly had charge of the company's distributor sales school, testing department and service work.

Schenectady, N. Y.—General Electric Company. The Apparatus Agency Division of G. E.'s Industrial Divisions has been replaced by a newly-organized Agency and Distributor Division. George L. Irvine has been appointed manager of the new division.

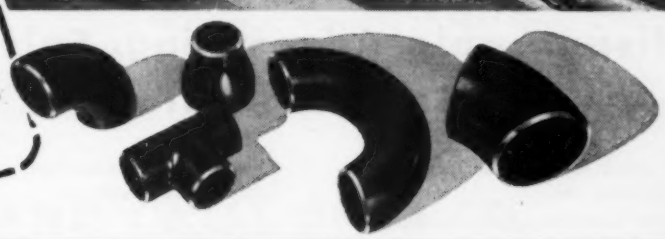
Palmyra, N. Y.—The Garlock Packing Company. Louis Mohn has been appointed general sales manager of the company. He succeeds Phil Arnold, vice-president and head of the company's general sales department, who has retired. Although retiring as head of the Garlock sales organization, Mr. Arnold will continue in a partially active capacity for an indefinite period as a vice-president of the company. Eugene Flannery has been named district manager at Pittsburgh to succeed Mr. Mohn.

(*Please turn to page 272*)

How to cut corners that cost



ANOTHER JOB DONE BETTER WITH GLOBE WELDING FITTINGS



PIPING "corners" can be costly—costly in initial installation, continual maintenance, flow resistance, pressure-loss, erosion, and corrosion.

You can "cut the corners that cost" with Globe Welding Fittings. Installation is simpler—faster. Your piping is safer, stronger with less weight—needed space reduced—insulation is easier and faster. There is less chance for erosion, corrosion, and leakage to develop because of the smooth inner walls, true radii and circularity of Globe Welding Fittings. Liquids and gases flow smoothly with less resistance and pressure-loss.

Decide to "cut the corners that cost" on your next piping job—specify and use Globe Welding Fittings, produced from Globe seamless steel tubes by the Globe Precision Process.

GLOBE STEEL TUBES CO., Milwaukee 4, Wisconsin

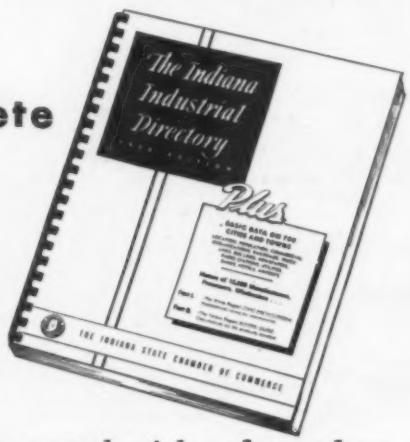
Producers of Globe seamless stainless steel tubes — Gloweld Welded stainless steel tubes — carbon — alloy — seamless steel tubes — Globeiron seamless high purity ingot iron tubes — Globe welding fittings.

For complete information on sizes and types send for Globe Welding Fittings Catalog.

GLOBE PRECISION PROCESS WELDING FITTINGS

Where to Buy or Sell in Indiana

Includes complete Travel and Shipping Information



Every businessman concerned with sales, advertising or distribution in Indiana should have a copy of this big, 300-page, 7th Edition of the Indiana Industrial Directory. Lists 700 cities, towns and communities in the state, with detailed information about 10,000 industries, banks, hotels, radio stations, utilities, etc., including personnel. Gives air, automobile and railroad routes, truck terminals, etc. *The only source for all of this information in one completely indexed book*—just off the press. To avoid bookkeeping mail check for $10.00 with order. Money cheerfully refunded if not as expected.

Indispensable Advertising, Sales and Shipping Data

1. 700 cities and towns, location, population, etc.
2. 10,000 businesses, description, officers, etc.
3. Transportation
   Railroads, air, bus and freight lines, type of service, etc.
4. Utilities
   Water, light and power, gas
5. Banks and officials
6. Newspapers—Publication Schedules, Officials, etc.
7. Institutions
   Schools and Colleges, Parks, etc.
8. Hotels
9. Airports
   Lines, officials, etc.
10. Radio Stations
    Affiliations, etc.

Only $10.00—pays for itself many times over!

INDIANA STATE CHAMBER OF COMMERCE

INDIANAPOLIS, INDIANA

Buffalo, N. Y.—Automatic Control Company. Dean M. Thomas, 1807 Elmwood Avenue, has been appointed western New York representative, handling engineering and sales of the company's automatic liquid controls.

Pittsburgh, Pa.—American Manganese Steel and Electro-Alloys Division, American Brake Shoe Company. Paul L. McCulloch has been transferred here from Rochester, as sales engineer.

New York, N. Y.—Air Reduction Sales Company. J. H. Berryman has been appointed assistant to the manager, technical sales division.

West Hartford, Conn.—Niles-Bement-Pond Co. Alexander H. d'Arcambal, vice-president and sales manager, small tools and gages, and consulting metallurgist, has been appointed general sales

Alexander H. d'Arcambal

manager. He will coordinate all domestic sales, foreign sales and sales promotional activities of the Pratt & Whitney Division, its subsidiary, Potter & Johnston Co., and the Chandler-Evans Division.

Davenport, Iowa—Nichols Wire & Aluminum Company. The company has announced the separation of its warehouse and mill divisions. C. D. Johnston has been appointed manager of sales-warehouse division. G. J. Brenneman has been appointed assistant sales manager-mill division.

Skokie, Ill.—Jas. P. Marsh Corporation. R. E. Barnett has been promoted to assistant sales manager of Marsh Instrument Company, sales affiliate. He has been with the Marsh organization for the past nine years.

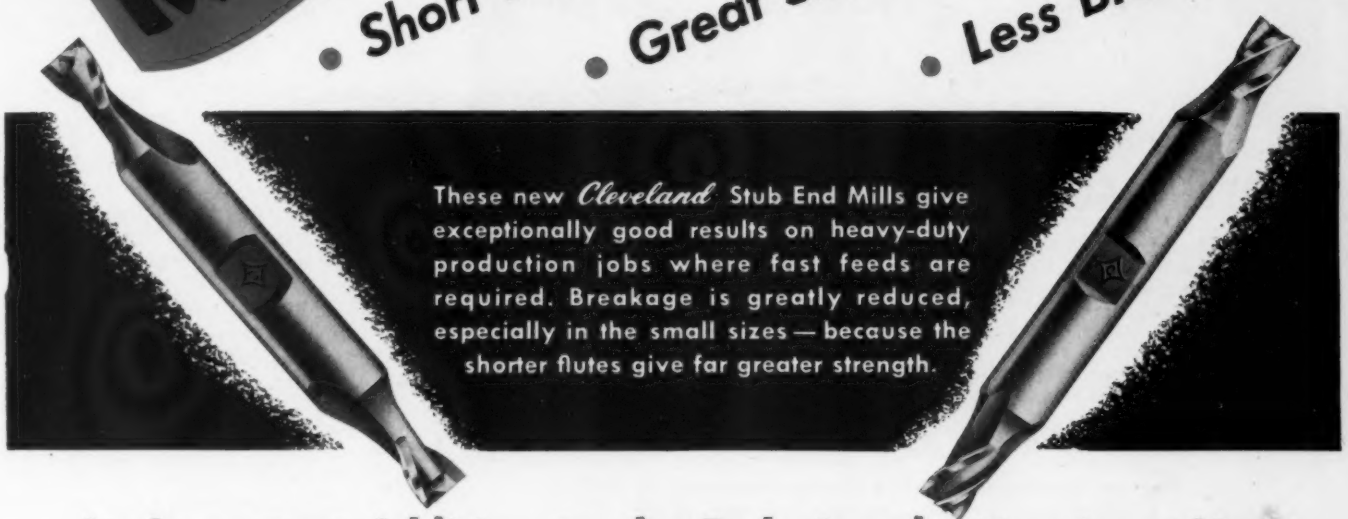
Youngstown, O.—The Youngstown Sheet and Tube Company. John M. Tuthill has been advanced to manager of flat rolled sales. He succeeds Walter E. Scott, who has retired after 43 years with the company.

New Britain, Conn.—Stanley Electric Tools, division of The Stanley Works. Fred O. Fuller has been appointed sales manager. He succeeds Henry W. Blackman, who has retired from active duty after 46 years with Stanley, and 20 years in the position of sales manager. Elmer W. Ellsworth has been named assistant sales manager.

(*Please turn to page* 274)

NEW! *Cleveland* STUB END MILLS

• Short Flutes! • Great Strength! • Less Breakage!


These new *Cleveland* Stub End Mills give exceptionally good results on heavy-duty production jobs where fast feeds are required. Breakage is greatly reduced, especially in the small sizes — because the shorter flutes give far greater strength.

An Important Addition to the Redesigned *Cleveland* Line

The new Stub End Mills have all the features of the redesigned ***Cleveland*** End Mills that have enabled these tools to set new records of performance wherever they have been tested. They have been carefully engineered to give you *More Cuts per Grind, Consistent Accuracy, Faster Production* and *Greater Economy.*

STRONGER No sharp corners or points where localization of stresses might occur. Minimum amount of metal has been cut away. (Stub End Mills have an *extra* factor of strength due to their shorter flutes).

CLEAR CHIPS BETTER Redesigned flutes are machine polished. There are no pockets. Chips are free to move.

GREATER ACCURACY New clearance and accurate machine polish of flutes result in closer control of size.

MORE DURABLE New-style clearance supports the cutting edge; assures against "flaking" or "chipping out".

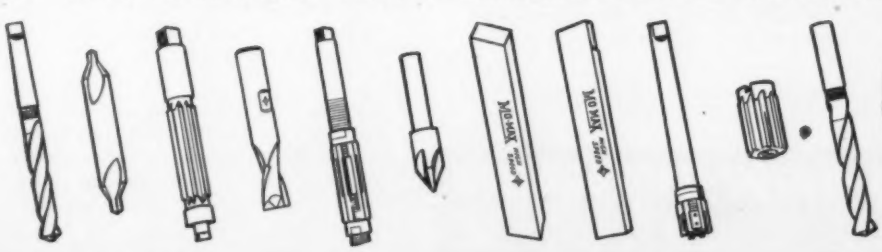
LONGER LIFE Radically new flute shape and chip clearing ability reduce wear on the cutting edge, thus maintaining consistent accuracy.

CUT FASTER New flute shape gives maximum cutting qualities at increased rates of feed.

Telephone Your
Industrial Supply Distributor

THE CLEVELAND TWIST DRILL CO.
1242 East 49th Street • Cleveland 14, Ohio
Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5 • Los Angeles 58
E. P. Barrus, Ltd., London W. 3, England

ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER *Cleveland* TOOLS



Save Money by Buying Your

SCREW MACHINE PARTS from KEMPSMITH

Now — You can get high-quality screw machine parts from a reliable manufacturer at a substantial saving. In the modern, well-equipped Kempsmith plant, you will find a battery of six spindle automatics from 9/16" to 3½" diameter and single spindle machines from 9/16" to 6¼" diameter. Also plenty of hobbing, splining, broaching and other second operation equipment. These high-speed, precision machines are available to YOU for producing your screw machine parts. They enable you to get costs down to meet competitive bids. All metals can be processed. Send us your blueprints. Our quotation will follow immediately.

KEMPSMITH MACHINE CO., 1863 S. 71st ST., MILWAUKEE 14, WIS., U. S. A.

KEMPSMITH

Supplying the Needs of Industry Since 1888

FAST ON-THE-SPOT REPAIRS

With This Portable Welder!

This inexpensive "Lincwelder", made by Lincoln Electric Co., Cleveland, O., is easily mounted on running gear or truck for welding service anywhere.

Welding at the breakdown-scene . . . adds up to savings in time and labor with this light but rugged 180 amp. Lincoln Welder, powered by a two-cylinder Wisconsin Heavy-Duty Air-Cooled Engine.

The performance satisfaction of Wisconsin Engine power increases not only the reliability of equipment in all fields, but also increases the confidence of both equipment user and builder. They're sold on such features as self-cleaning, thrust-absorbing Timken tapered roller bearings at both ends of the crankshaft . . . fool-proof air-cooling, from sub-zero to 140°F . . . an easily serviced OUTSIDE rotary type, high tension magneto with impulse coupling, for quickest any-weather starts . . . plus heavy-duty construction, inside and out.

Your investigation is invited! 3 to 30 hp., 4-cycle single-cylinder, 2-cylinder, and V-type 4-cylinder models.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 14, WISCONSIN

New York, N. Y.—Electro Metallurgical Division, Union Carbide and Carbon Corporation. H. M. Rich, Jr., has been appointed general sales manager.

Houston, Tex.—Ampco Metal, Inc. Southern Engine & Pump Company has been named distributor here for the Ampco centrifugal pump line.

Lorain, O.—Nelson Stud Welding Division, Morton Gregory Corporation. Walter E. McArthur has been appointed manager of industrial sales.

Memphis, Tenn.—Pyrene Manufacturing Company. James J. Jackson has been appointed sales representative to cover Tennessee, Arkansas, and Mississippi.

Philadelphia, Pa.—The Fafnir Bearing Company. Warehouse facilities have been expanded here with the acquisition of a building at 4006 York Road. The structure now houses Fafnir's branch office and warehouse stock, providing several times the area available in the former location.

Chicago, Ill.—John A. Roebling's Sons Company. E. A. Trask, former head of the San Francisco office, is now manager of sales of the company's Chicago corporation. G. C. Bukowsky, former manager of the Portland, Ore. branch, has succeeded Mr. Trask.

Atlanta, Ga.—Bridgeport Brass Company. Donald H. Waddington has been added to the sales staff of the company's office here. He will work under the direction of James E. Byrne, district manager.

Indianapolis, Ind.—E. C. Atkins and Company. Augustus Vogel, Jr. has been appointed manager of the file division of the company. Previously, Mr. Vogel had represented the Nicholson File Company.

Springfield, Mass.—Standard Pressed Steel Company. Standard Industrial Supply Company, Inc., has been appointed to distribute SPS products.

Seattle, Wash.—The Harrington Company. Denis J. Mullane has been named West Coast sales manager. His office here is at 1052 E. Thomas Street.

Denver, Colo.—Lukens Steel Company. David W. Jones, Jr., will represent the company and its divisions, By-Products Steel Company and Lukenweld, in the sale of steel plate and specialty plate products in the Rocky Mountain area.

Warren, O.—The Thomas Steel Company. R. C. Lewis has been appointed assistant sales manager.

Dallas, Tex.—Hercules Powder Company. The company's naval stores department office here has been expanded to handle the sales of turpentine, pine oil, rosin, and rosin derivatives as well as toxaphene.

(*Please turn to page 276*)

ELASTIC STOP NUTS

Cut Production Costs

PROTECT BOLTED FASTENINGS ON BALDWIN DIESELS

4500 H. P. Three Unit Baldwin Diesel Locomotive

—the Red Elastic Collar locks each positioned setting against VIBRATION! SHOCK!

For more than eight years the Baldwin Locomotive Works have used Elastic Stop Nuts on all main bearing caps of their line of Diesel Locomotives. This critical application again proves Elastic Stop Nuts to be "design insurance" for trouble-free bolted connections. Baldwin engineers also found that the single-unit Elastic Stop Nut, used in place of double nuts or castellated nuts and installed with power tools, speeded up production!

Railroad Operators have learned that this one-piece positive stop nut cuts shop inspection time... because it is easily removed with a wrench... and quickly reapplied without the complications of adjusting double nuts or positioning cotter keys.

Vibration and strain set up by high speed passenger service... stress reversals brought about by sudden air brake applications... the jarring thuds of freight car loading... will not shake Elastic Stop Nuts loose. Once positioned they keep their precise settings permanently.

Further, Elastic Stop Nuts not only protect against vibration, impact and stress reversal, but the Red Elastic Collar keeps inside bolt and nut threads rustfree... permits easy removal for replacement and repair. Use Elastic Stop Nuts on your equipment to eliminate fasteners as a source of field service complaints... reduce customers' maintenance costs!

HERE'S A CHALLENGE: Send us complete details of your toughest bolted trouble spot. We'll supply test nuts—FREE, in experimental quantities. Or, if you want further information, write for literature. Elastic Stop Nut Corporation of America, Union, N. J. Representatives and Agents are located in many principal cities.

ESNA TRADE MARK

THE FAMOUS RED ELASTIC COLLAR IS VISIBLE EVIDENCE OF LOCKING SECURITY

Threadless and permanently elastic, it provides these 4 outstanding features:

1. **Protects against nuts loosening due to VIBRATION**
2. **Keeps locking threads CORROSION FREE**
3. **Provides for accurate BOLT LOADING**
4. **Seals against LIQUID LEAKAGE along the bolt threads**

ELASTIC STOP NUTS

HIGH TENSILE

ANCHOR

HIGH TEMPERATURE

SPLINE

CLINCH

GANG CHANNEL

NYLON CAP

OVER 450 TYPES AND SIZES IMMEDIATELY AVAILABLE FROM STOCK

Want Additional Product Information? See Page 19.

Which one of these Bond REG. U.S. PAT. OFF. TRUCK CASTERS is BEST for Your Job?

1A Series—Stationary Caster

3A Series—Single Ball Race Swivel Caster

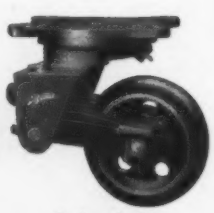
3F Series—Single Ball Race Swivel Caster—Pipe Socket Base

3J Series—Single Ball Race Swivel Caster with Threaded Stem

3G Series—Single Ball Race Swivel Caster—Angle Base

14A Series—Tongue Swivel Caster

23A Series—Double Ball Race Swivel Caster


Spring Action Swivel Caster

36A Series—Double Ball Race Swivel Caster

40A Series—Double Ball Race Structural Steel Swivel Caster

41A Series—Structural Steel Stationary Caster

Dual Wheel Swivel Caster

V-Grooved Wheel Caster

Structural Steel Caster with Wheel Brake

Vulcanized-on Rubber Tread Wheel

Solid Rubber Wheel

15D Series—Swivel Stem Caster

BOND *built-for-the-job* Truck Casters assure efficient, profitable production! Write today for your copy of the Bond Catalog K-38—you'll find complete descriptions of the full line of Bond Casters and Wheels.

BOND FOUNDRY & MACHINE COMPANY
MANHEIM • PENNSYLVANIA

Chicago, Ill.—Inland Steel Company. Anthony M. Ryerson has been named assistant general manager of sales. He succeeds Neele E. Stearns, recently elected executive vice-president of the Inland Steel Products Company, Milwaukee, an Inland Steel subsidiary.

Baton Rouge, La.—The Foxboro Company. Joseph M. Temple has been appointed manager of the branch office located here at 115 N. 19th St. He succeeds John B. Deaderick, now manager of the Tulsa, Okla. office.

Chicago, Ill.—Greene, Tweed & Company. John R. Boyer has been appointed sales representative for the Chicago and South Bend areas, and Wisconsin.

Chicago, Ill.—Rolock, Inc. Elmer A. Terwell has been appointed sales engineer in the Chicago territory. He is located at 3382 Avondale Avenue.

INDUSTRIAL DEVELOPMENTS

The Congdon & Carpenter Company, Providence, R. I., steel, metals, and industrial supplies, is currently marking its 160th year in business. The firm was founded in 1790 by Joseph Congdon, whose direct descendants, G. W. Congdon and Johns H. Congdon, II, are now president and vice-president, respectively.

Ohio Adhesives Corporation has completed construction of a new plant at New Philadelphia, O. The factory manufactures resin and rubber adhesive for the industrial, automotive and building trade.

American Felt Company, Glenville, Conn., has announced the election of William H. Lehmberg as vice-president. He is chief engineer, and also general manager of the Glenville plant of the company.

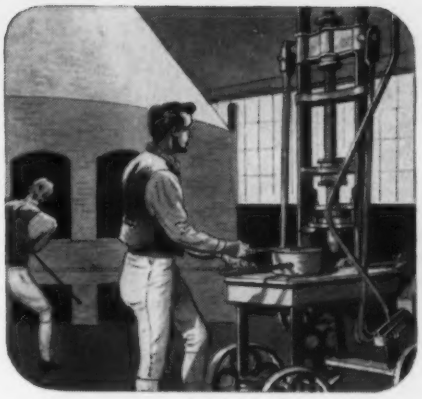
George L. Draffan, president of The Ohio Brass Company, Mansfield, O., has been elected to the board of directors of the National Association of Manufacturers. He will serve for the year 1950, and will represent the Central Ohio district.

Tube Turns of Canada, Ltd., which was recently granted its Dominion charter, is establishing a modern plant in Chatham, Ontario. The company, a subsidiary of Tube Turns, Inc., Louisville, Ky., will manufacture Tube-Turn welding fittings.

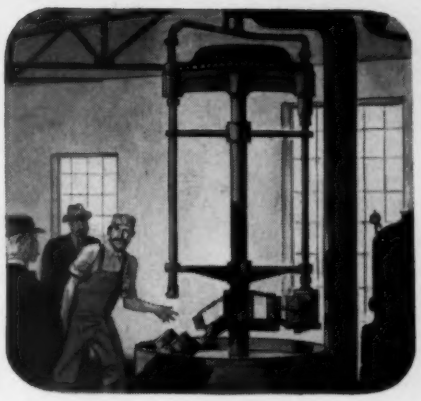
Alan Wood Steel Company was scheduled to put into operation on January 23 its new $9,000,000 plant addition at Conshohocken, Pa. The plant is said to provide eastern Pennsylvania with the first hot rolled strip mill in its history. The mill will have an estimated finishing capacity of 218,000 tons annually.

(*Please turn to page* 278)

1 **1621**—Glass was money! America's first glass factory was actually a mint—not for the manufacture of coins but to make glass beads for *use* as money when buying land, food and furs from the Indians.



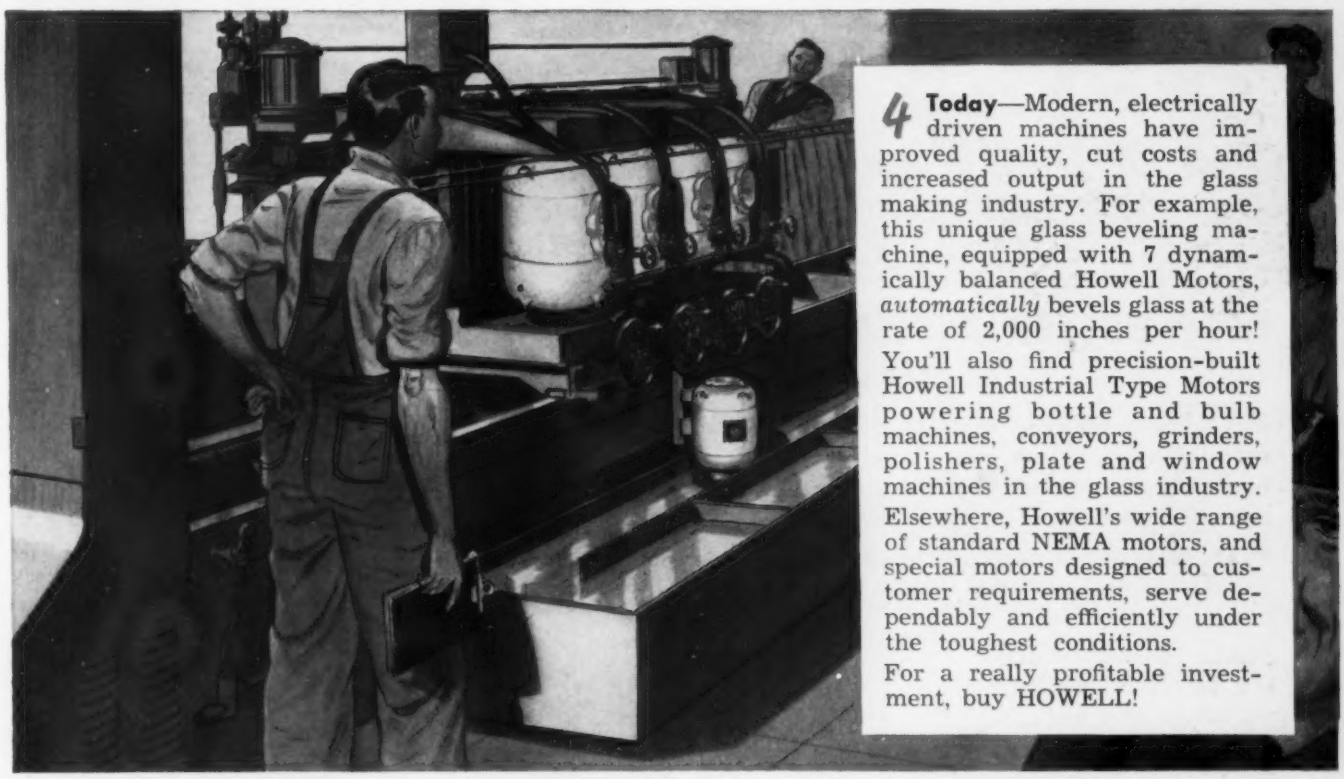
2 **1827**—Blown glass was the rule until Enoch Robinson, a carpenter, figured glass could be *pressed* into shape . . . the glass pressing machine was born. Electricity to power new machines was still to come.



3 **1899**—Owens invented a machine to make bottles as the machine age arrived in glass. By 1915, Howell "Red Band" Motors were making important contributions to this and other industries.

ANOTHER HOWELL SUCCESS STORY

GLASS...from artisans to automatic machines



4 **Today**—Modern, electrically driven machines have improved quality, cut costs and increased output in the glass making industry. For example, this unique glass beveling machine, equipped with 7 dynamically balanced Howell Motors, *automatically* bevels glass at the rate of 2,000 inches per hour!

You'll also find precision-built Howell Industrial Type Motors powering bottle and bulb machines, conveyors, grinders, polishers, plate and window machines in the glass industry.

Elsewhere, Howell's wide range of standard NEMA motors, and special motors designed to customer requirements, serve dependably and efficiently under the toughest conditions.

For a really profitable investment, buy HOWELL!

Free enterprise encourages mass production, supplies more jobs — provides more goods for more people at less cost.

Howell totally enclosed, fan-cooled motor—windings completely sealed against dirt and weather.

HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Precision-built Industrial Motors Since 1915

HOWELL Red Band MOTORS

BEALL
SPRING WASHERS

KEEP BOLTED ASSEMBLIES *permanently* TIGHT

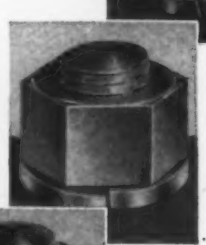
BEALL helical SPRING WASHERS have "live action" and constantly exert tightening pressure over a long range. They compensate for ALL causes of looseness including vibration, bolt stretch, wear and breakdown of finish under the nut and bolt head.

IN STOCK in all Standard Sizes; made of Carbon Steel, Stainless Steel, Everdur, Duronze, and other metals.

BEALL TOOL DIVISION
HUBBARD & CO.
160 Shamrock St., East Alton, Ill.

p. s. Please write or wire for latest Catalog and Price List.

TIGHT *when assembled*



TIGHT *in service*

TIGHT *after long service*

Nelson Stud Welding Division of Morton Gregory Corporation, Lorain, O., has announced the establishment of the Nelson Stud Welding Company of Canada, Ltd., with manufacturing facilities in Toronto.

Kaiser Aluminum & Chemical Sales, Inc., Oakland, Calif., is now acting as sales agent for Benson aluminum drums for the chemical industry under an agreement with the Benson Manufacturing Company, Kansas City, Mo.

Joseph T. Ryerson & Son, Inc., has completed a large brick and steel addition to its Chicago, Ill. plant. The new building provides approximately 118,000 square feet of modern plant and office space, and is a part of the company's over-all expansion program.

Ryerson's New Chicago Addition

The Hamilton Steel Company, Cleveland, O., is now a wholly owned subsidiary of Fort Duquesne Steel Company, Pittsburgh, Pa., the stock interest of the Hamilton family having been retired. Harry K. Hamilton, founder, retired on December 31 as president and director. He at one time was purchasing agent of Delco Company, and of Speedwell Motor Car Company.

Arthur T. Dalton, Chicago Wheel & Mfg. Co., Chicago, Ill., appears on the American Broadcasting Co. WENR-TV television show, "Our Gal Toni", on Friday nights. The commercial shows the Handee Tool of 1001 uses and Chicago-mounted wheels in action doing various kinds of work, including a demonstration of internal plastic carving.

A. T. Dalton and "Our Gal Toni"

Chase Bag Company, Chicago, Ill., has completed a new warehouse and office facilities at its Orlando, Fla. branch.

MESTA Forgings

The illustration shows a forged steel rotor shaft for a turbine driven generator installation at Grand Coulee Dam. The shaft was manufactured complete, from raw materials to finished product, in the Mesta Shops.

Mesta Forge Shops produce carbon and alloy steel forgings in all sizes required by industry, including crankshafts, marine parts, rolls, pinions, pressure vessels, pump blocks, table rollers, coupling halves, gears, spindles, and many others.

Write for descriptive forging literature.

DESIGNERS AND BUILDERS OF
COMPLETE STEEL PLANTS

MESTA MACHINE CO.

PITTSBURGH, PENNSYLVANIA

PAGE WIRE

LOW CARBON
HIGH CARBON
STAINLESS
SPECIAL ALLOY
ARMCO IRON

ROUND

FLAT

OR

SHAPED

You draw the Shape
—Page can draw the Wire

—the way you want it for your production—whether it's ALL of your product, or only a part.

Cross-sectional areas up to .250" square; widths to ⅜"; width-to-thickness ratio not exceeding 6 to 1.

for Wire or Information about Wire—

Get in touch with Page!

ACCO

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Pittsburgh, Philadelphia, Portland, San Francisco, Bridgeport, Conn.

PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

NEW OFFICERS OF THE ELECTRIC INDUSTRIAL TRUCK ASSOCIATION

M. W. Heinritz of Trenton, N. J., vice president of the Gould Storage Battery Corporation, has been elected president of The Electric Industrial Truck Assn., and W. A. Meddick, vice president and sales manager of the Elwell Parker Electric Company, Cleveland, was named vice president. Wm. C. Brandt of Philadelphia, managing director of the association, was re-elected secretary-treasurer. The membership of the association is composed of some 90% of the firms in the United States manufacturing electric powered industrial trucks and auxiliary equipment.

M. W. Heinritz

W. A. Meddick

"There are a number of areas in cost reduction in every business", said Mr. Heinritz, "and every reduction in the cost of handling, whether in production flow, in storage, or in shipment of goods to customers, finds reflection in the final delivered price of a manufacturer's product. Although many other factors help to determine this delivered price, significant reductions in these costs which add nothing to the value but only to the price of a product can be realized. These afford the greatest opportunity for worthwhile savings in any business, and aid producers to meet competition successfully."

* * *

U. S. TESTING AND ESSELEN RESEARCH MERGE

The integration of two of the leading scientific laboratories in this country, the United States Testing Company, Inc., Hoboken, N. J., and the Esselen Research Corp., Boston, Mass. has been announced. On January 1, the Esselen Research Corporation became the Esselen Research Division of the United States Testing Co., Inc., and will continue its operations in Boston.

* * *

DIRECTORY OF PAPER AND ALLIED TRADES

Announcement is made by Lockwood's Directory, 15 W. 47th St., New York, of the 1950 edition of Directory of the Paper and Allied trades. The directory is published in two editions—the full regular edition and the pocket-size Traveler's edition covering only the reports of the paper and pulp mills and reports of the converters, with list of mill officials and executives.

(*Please turn to page 282*)

WANTED!

TOUGH METAL CUTTING JOBS
BY *Molyflex*

STAR'S NEW SHATTERPROOF HIGH-SPEED BLADES

Eat their way . . . easier . . . faster . . . through any metal cutting job you may have!

In recent tests these hand blades averaged 23.8% more metal cut than all leading brands tested. Absolutely shatterproof! A cinch to help you cut costs and speed up those tough metal cutting jobs.

STAR STEELRITE METAL MARKING CRAYONS

Try Star's new metal marking crayons. Ideal for use on hot, cold, damp or grimy metal. Withstand pickling, yet do not affect enamel application.

Star's Metal Cutting Booklet and Wall Chart are yours for the asking and will help you get top efficiency from hack saw blades.

CLEMSON BROS., INC.
Middletown, N. Y.

Makers of Hand and Power Hacksaw Blades. Frames. Metal Cutting Band Saw Blades and Clemson Lawn Machines.

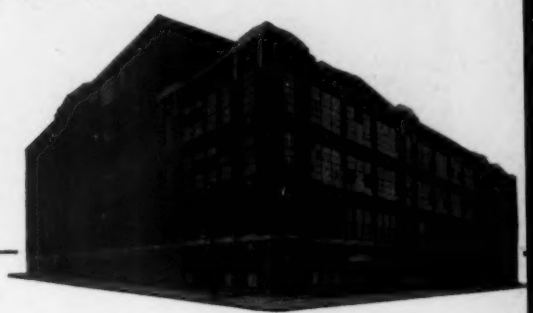
M·S·A

SAFETY EQUIPMENT HEADQUARTERS

for every industry

leader in safety Research

Foundation of Mine Safety Appliances Company's long leadership in the safety equipment field is Research . . . conducted by a large staff of scientists, in laboratories equipped with complete facilities for work of the most advanced nature. M.S.A.'s Safety Research is integrated closely with that of governmental and institutional organizations, for the benefit of safety progress everywhere.



. . . and in safety equipment Manufacture

M.S.A. is the largest commercial producer of approved safety equipment for industry. Every resource of design, engineering, materials, workmanship and control of quality is employed to assure *maximum safety, comfort and practicality* in the use of our equipment by the industrial worker. These qualities are expressed in the scores of separate M.S.A. products serving better safety throughout the world.

. . . and in safety Service

In principal industrial cities and towns, and in major mining districts, M.S.A.'s District Offices are centers of service in safety. Our trained representatives are thoroughly equipped to be of assistance over a wide range of demands—our warehouse stocks in strategic locations speed delivery of needed equipment. For prompt help on your safety problems and product requirements, *let M.S.A. Service serve you!*

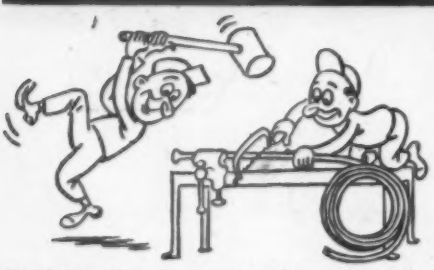
M·S·A

MINE SAFETY APPLIANCES COMPANY

Braddock, Thomas and Meade Streets · Pittsburgh 8, Pa.

At Your Service: 54 BRANCH OFFICES IN THE UNITED STATES AND CANADA

ELCO



ELCO COLD HEADING PUTS QUALITY IN "THE SCREWS YOU LIKE TO USE"

Cold Heading is simply taking the end of a piece of steel wire (or iron, or brass, or aluminum, or even stainless steel) — and mashing it down to form the head for the screw, or bolt, or special piece. We use special dies, of course, to do the forming and we get accurate, uniform results because of our careful inspecting. Cold heading is fast, too, and economical, and versatile — we recently redesigned an assembly over to cold heading, and are saving a customer $48.15 every thousand pieces. Cold heading, with the right kind of dies, produces smoother, stronger, cleaner, more uniform, more accurate screws — ELCO Screws.

Close-up of a Smash Hit

That die holder is going like the dickens — 225 pieces a minute, two raps per piece — to make heads on 8-32x¾" round head machine screws.

ELCO TOOL & SCREW CORP.
1912 BROADWAY • ROCKFORD, ILL.

ELCO PRODUCTS

AND Special Parts

INDUSTRIAL PURCHASING MEN TO SELECT CITY PURCHASING AGENT FOR WORCESTER, MASS.

A committee of prominent industrial purchasing men of Worcester, Mass. is now reviewing applications for the post of Purchasing Agent for the city's newly authorized central purchasing office.

City Manager Everett F. Merrill named the committee recently with the concurrence of the City Council. He has announced that he will appoint its final choice to the position.

Members of the committee are Herbert Layport, Wyman-Gordon Company; George D. Seguin, Norton Company; John H. Johnson, Morgan Construction Company; and Russell K. Thomajan, Baldwin-Duckworth Company, Division of Chain-Belt Company.

Mr. Layport, chairman of the committee, is educational chairman for District 9, N.A.P.A., and a member of the board of directors of the New England Association. All the other members of the committee are active in the National Association of Purchasing Agents.

In describing the qualifications for the appointment, Mr. Layport said that the applicant must be a purchasing agent or an assistant purchasing agent, and should have at least five years' experience in general purchasing. Applications may be sent to Mr. Layport c/o Wyman-Gordon Company, 103 Madison St., Worcester, Mass.

REYNOLDS FOIL DIVISION ORGANIZES CONTAINER DEPARTMENT

The Foil Division of Reynolds Metals Company, Richmond, Va., has organized a new container department which will be headed by George Du Charme, formerly Can Industry Manager for the company, who will be known as the Product Sales Manager. A. S. Hartanov is assistant manager of the department and will continue to handle the "Reynolds Pak" program.

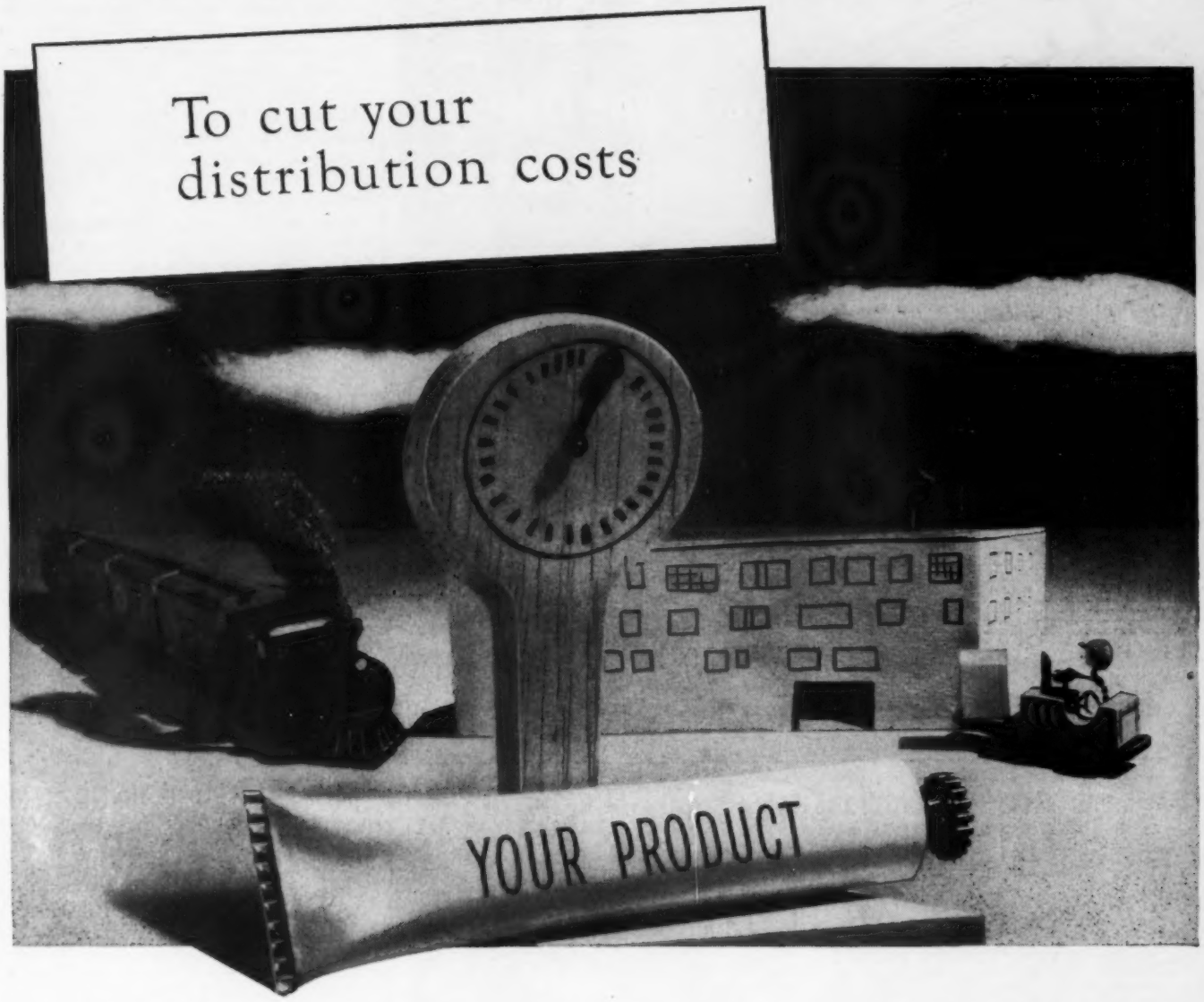
The new department will continue the development of aluminum can and foil lined fibre container business through can manufacturers, as well as the future development of other foil containers.

ILLINOIS TOOL WORKS TO MAKE BOOTS SELF-LOCKING NUTS

Announcement is made by the Illinois Tool Works, Chicago, Ill., that it has secured exclusive license from Boots Aircraft Nut Corp., Stamford, Conn., to manufacture and sell their Tri-Lok and Hex-Lok self-locking nuts, which provide unusual resistance to vibration loosening. The company has set up facilities for producing the nuts in their Elgin, Ill. plant. The Boots Company will continue to supply the aircraft industry. Illinois Tool will add the nuts to the Shakeproof fastening line.

(*Please turn to page 284*)

SPECIFY SHEFFIELD....



You save freight, conserve warehouse space, reduce handling time—by packaging your products in tubes made by Sheffield. *Sheffield Process* tubes are light, compact, easy-to-handle . . . all qualities that cut your distribution costs right down the line!

Consider, also, that Sheffield alone offers you all these three services:

1. Supply of matching tube cartons as well as tubes.
2. Filling of your bulk products in tubes, tins, or jars.
3. Shipment of your product to market.

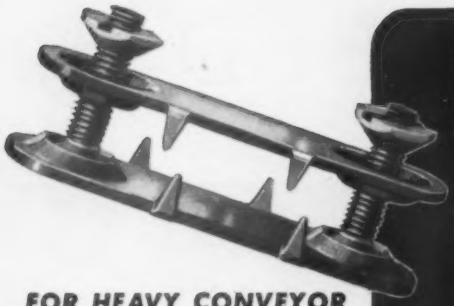
• • •

For higher net profits resulting from fast complete service and tubes of uniform high quality, try Sheffield next time you order. Write us for Tube Catalog. Or send us samples of your product that we may find exactly the right tube for it. No obligation, of course.

All types of tin, tin-coated, aluminum, lead, and Sheffalloy tubes.
Also one-shot tubes for single use applications.

THE SHEFFIELD TUBE CORPORATION
HOME OFFICES · NEW LONDON, CONN.
W. K. SHEFFIELD, V. P. CHICAGO 16, ILLINOIS T. C. SHEFFIELD
NEW YORK 18, N. Y., 500 FIFTH AVENUE 3132 CANAL STREET LOS ANGELES 38, CAL., 7024 MELROSE AVE.
EXPORT: 500 FIFTH AVE., N. Y. CABLE "DENTIFRICE", NEW YORK

New England SHEFFIELD PROCESS TUBES



FLEXCO

BELT FASTENERS AND RIP PLATES

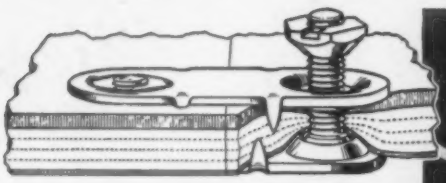
FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

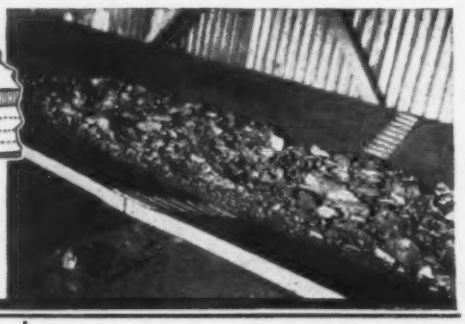
FLEXCO Fasteners make a tight, butt joint of great strength and durability . . . distribute the strain uniformly. Operate smoothly over flat, crowned or take-up pulleys. Made of steel, Monel, Everdur and Promal.

FLEXCO Rip Plates are for repairing and patching damaged belts.

Ask for Bulletin F-100

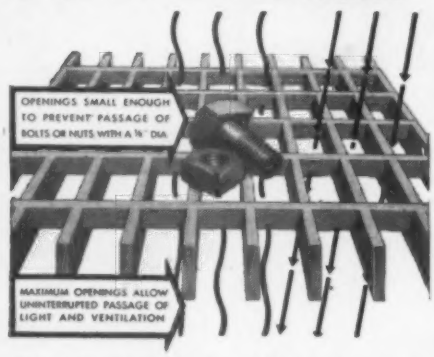
FLEXIBLE STEEL LACING COMPANY • 4697 Lexington St., Chicago 44, Illinois





Strong, Smooth, Readily Troughing
Order From Your Supply House

TRI-LOK RECTANGULAR
OPEN STEEL FLOORING


OPENINGS SMALL ENOUGH TO PREVENT PASSAGE OF BOLTS OR NUTS WITH A ½" DIA.
MAXIMUM OPENINGS ALLOW UNINTERRUPTED PASSAGE OF LIGHT AND VENTILATION

Tri-Lok strength is obtained by truss action through twisted cross-bar, curved in opposite directions at each bearing-bar. Standard openings in Tri-Lok Rectangular Steel Flooring are 1" x 3⅞"—other size openings can be supplied as required.

Diagonal, or Super-Safety U-type Flooring, and stair treads of all types, are available. Bulletin KH1140 describes the construction features of Tri-Lok Open Steel Flooring.

DRAVO CORPORATION

National Distributor for the Tri-Lok Company

Dravo Bldg., Pittsburgh 22, Pa.

Sales Representatives in Principal Cities

DRAVO

COLORFUL *Signs*

OF LIFETIME PORCELAIN ENAMEL

- ***ADVERTISING*** — Service stations and other point-of-sale and identification signs and highway signs . . . *for all types of erection.*
- ***INDUSTRIAL*** — Danger, Caution, Notice signs in standard colors and sizes . . . any wording desired . . . economically priced.
- ***OIL FIELD*** — Well, Lease, Tank Battery signs . . . with individual descriptions.
- ***MUNICIPAL*** — Traffic signs conforming to official standards . . . street markers, pedestal or bracket mountings.

FIRST COST IS THE LAST!

Southwestern Porcelain signs require only occasional cleaning to retain their original brightness for years and years.

WRITE FOR CATALOG AND PRICES!

SPS SOUTHWESTERN PORCELAIN STEEL CORP.
601 WRIGHT BLDG. TULSA, OKLA.

USE OF INDUSTRIAL PROCESS CONTROL CHARTS STRESSED

The importance of regular charting of quality trends at critical stages of industrial processes was stressed in a paper delivered to members of the Syracuse Section of the American Society for Quality Control by Jerome R. Steen, Director of Quality Control for Sylvania Electric Products Inc.

Steen, one of the first advocates of scientific quality control methods in the radio tube industry, drew upon his experience to cite several case histories in which the application of modern statistical quality control methods helped solve various problems more quickly and more economically than older rule-of-thumb inspection methods. It has been found also that the actual posting of data has been helpful in the boosting of worker morale since it permits seeing at a glance the acutal quality score.

According to the speaker, average and range charts as well as charts of many other types can be of great value not only in the location of existing troubles, but also in the forecasting and arresting of troubles which are developing. By being forewarned the requisite corrective action may be taken before the process begins to produce defects.

"There are several different forms of control charts," Steen said, "and all are based upon the premise that certain amount of variation is natural and is present in every process. When this natural variation is exceeded," he continued, "there exists good reason to believe that the process has changed, or has gone 'out of control'." Elaborating on this theme, he pointed out cases where the use of control charts discovered such conditions as die wear, test equipment failure, and operator error long before they would have been detected in any other manner.

Finally, Mr. Steen pointed out that "In order to secure maximum benefit from the use of control chart procedures, each application must be considered carefully in the light of such questions as: Is the test difficult? Is it expensive? Is it destructive The answers to these and to other questions will determine the type of chart to be used, the size and kind of sample, the time interval between samples, and the action to be taken based on control chart findings."

MECHANIZED CONTROL CUTS INVENTORY INVESTMENT ALMOST 10%

Mechanized inventory control has cut inventory investment almost 10% and boosted efficiency in keeping tabs on 50,000 different items stocked by United Air Lines, according to D. V. O'Leary, director of purchasing and stores, who described the airlines inventory control system at the recent Chicago conferences of the American Management Association.

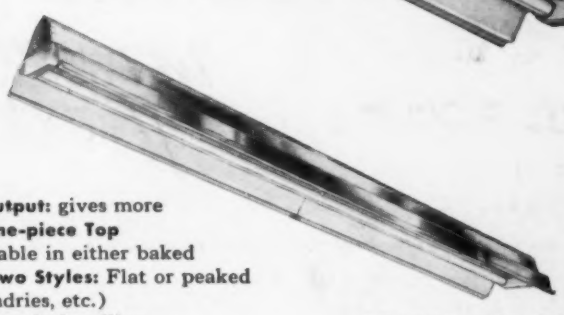
Since United switched from hand-posting to mechanized control in 1948,

(*Please turn to page* 286)

modernize your plant lighting with the Wheeler T-12 slimline fixture

NEW

Here's the latest product of Wheeler "Skilled Lighting"! It reflects almost 70 years of design and engineering experience in the manufacture of top-value lighting equipment. This new addition to the Wheeler Line is offered in two styles . . . with flat top channel for ordinary plant locations; with peaked top for locations where excessive moisture and dust-laden air conditions exist.



PEAKED TOP MODEL

6 Better-Value Features **1. High Output:** gives more light per foot of lamp length. **2. One-piece Top Channels:** made of heavy gage steel. Available in either baked enamel or vitreous porcelain enamel finish. **3. Two Styles:** Flat or peaked top channels (the latter for textile mills, foundries, etc.) **4. Reflectors in Sections:** for greater ease in handling, each unit furnished with two open-end-type porcelain enamel reflectors. **5. Individual or Continuous Mounting.** **6. Latest G.E. Twin-Turret Type Lampholders** (depressable): for single pin contact, making lamp insertion and removal simple.

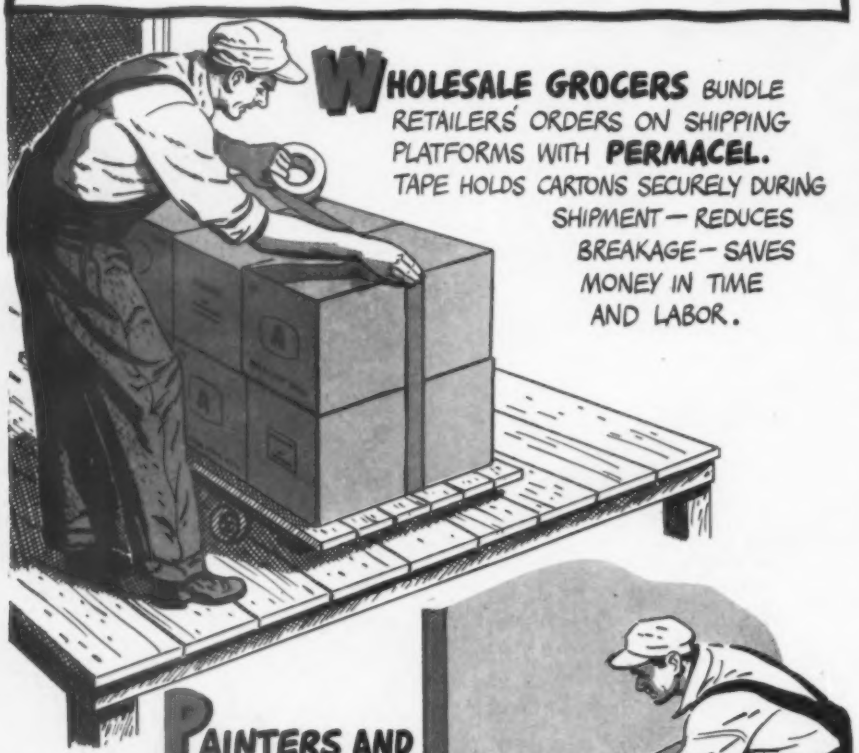
The new T-12 Slimline Unit is designed for use with two 75 watt, 96" T-12 Slimline single pin lamps (instant starting) operating at 425 MA. Send for complete details of this new "Skilled Lighting" fixture built to stay new-looking for years. *Wheeler Reflector Company, 275 Congress St., Boston 10, Mass.* Also New York, N. Y. Representatives in principal cities.

DISTRIBUTED EXCLUSIVELY THROUGH ELECTRICAL WHOLESALERS

Wheeler REFLECTORS SKILLED LIGHTING

MADE BY SPECIALISTS IN LIGHTING EQUIPMENT SINCE 1881

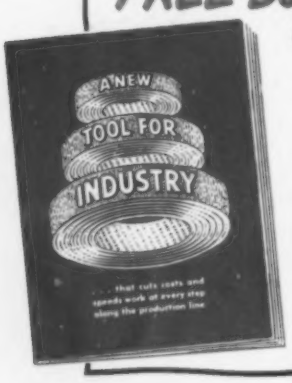
HOW TAPE HELPS INDUSTRY SAVE TIME, CUT COSTS...



WHOLESALE GROCERS BUNDLE RETAILERS' ORDERS ON SHIPPING PLATFORMS WITH **PERMACEL.** TAPE HOLDS CARTONS SECURELY DURING SHIPMENT — REDUCES BREAKAGE — SAVES MONEY IN TIME AND LABOR.

PAINTERS AND PAINTING CONTRACTORS STRIP **PERMACEL** ON TOP OF BASEBOARD TO FORM PROTECTIVE SHELF WHEN PAINTING INTERIOR WALLS. **TAPE** STRIPS OFF EASILY — SAVES TIME — ASSURES BETTER PAINT JOB.

FREE BOOKLET SHOWS HOW TAPE CAN HELP IN YOUR BUSINESS



Whatever your business, chances are you'll find the facts, figures and pictures in this 12-page booklet will help you cut costs! Just drop a note—on your business letterhead, please—to the address below for your copy.

PERMACEL offers a complete line of tapes—each one *laboratory-developed,* carefully tested under toughest conditions for tensile strength, adhesion, stretch.

Permacel®
INDUSTRIAL TAPES
INDUSTRIAL TAPE CORPORATION • NEW BRUNSWICK, N. J.

(*Continued from page 284*)

said Mr. O'Leary, "out of stock" conditions have declined 50%; duplication of items has dwindled sharply; cash needs have been forecast faster and more accurately for management; detection of inactive items has been speeded up, and separation of low dollar value items from high dollar items has been simplified.

"In order to prove mechanized reports are more accurate than hand-posted records, said Mr. O'Leary, "We maintained duplicate sets of records for three months. The same posting media were routed both to the machine accounting group and to our posting clerks. At the end of the test we reconciled balances on the 4,000 items in process and found there were discrepancies between the two records on ten per cent of all items. It was then determined that 90% of the discrepancies were due to errors in hand-posting."

Reductions in "out of stock" conditions have contributed to United's program of year 'round dependability, he said. Supplies are maintained in adequate quantities, he explained, through use of weekly reports which list all active items with balances near or below order point.

In summarizing mechanized control, he said its advantages over handposting are (1) greater accuracy, (2) greater flexibility of control records, (3) expanded availability of information and (4) better planning for management. "This has been accomplished without sacrificing any information that was previously contained in our hand-posted records", he said.

HARDWOOD COMMERCIAL STANDARD

Commercial Standard CS35-49, Hardwood Plywood, (fourth edition), effective as of December 1, 1949, is announced by the Commodity Standards Division, National Bureau of Standards, Washington, D. C. The standard is now in the hands of the printer, and after printing copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

U. S. RUBBER BUYS GLENN L. MARTIN CHEMICALS DIVISION

The United States Rubber Company has purchased the Chemicals Division of The Glenn L. Martin Company, according to a joint announcement by the two companies. The rubber company will acquire all assets of the division, including the Marvinol vinyl resin plant at Painesville, Ohio, laboratory equipment in Baltimore, patents and the tradename Marvinol.

The business will become a part of the Naugatuck Chemical Division of the Rubber company. The Painesville plant will continue to make Marvinol vinyl

(*Please turn to page 288*)

Break bottlenecks in production and your COSTS TUMBLE

goes a pallet load. High stacking of multi-unit ds puts storage space to fullest use. Yale High Lift rk Trucks handle loads up to 30,000 lbs. in a single eration. High Lift Platform Trucks have capacities to 50,000 lbs. Low Lift models, to 60,000 lbs.

e Crane Trucks are used to lift and stack all kinds of ds in plant and yard. They also transport material, ed assembly of machinery and handle many maintance jobs. They slew and boom easily, travel fast. pacities up to 10,000 lbs.

Production gets in a jam when material isn't kept "on the move." If you are up against this problem in your plant, it will be well worth your while to learn how modern material handling machinery can open the way to greater output.

Right now you may not know exactly what kind of handling equipment will do the best job and save money at the same time. So your best bet is to get the benefit of the experience of Yale & Towne, pioneer in the manufacture and correct application of material handling machinery.

The Yale line of material handling machinery is so complete and diversified that selection for specific requirements is easy. Whether you need hand or electric hoists, hand lift or power trucks or scales, Yale representatives throughout the nation and the world will gladly help you find ways to break production bottlenecks, save time and effort and cut handling costs.

Take care of the present and plan for the future with Yale Material Handling Machinery. Get in touch with our nearby representative or write direct to headquarters.

TOOLS THAT KEEP INDUSTRY "ON THE MOVE" YALE

THE YALE & TOWNE MANUFACTURING CO.

Department L-98

Roosevelt Boulevard **Philadelphia 15, Pa.**

Fragile loads are handled safely and efficiently by thi fast Load King Wire Rope Electric Hoist. Yale make time and effort saving electric hoists in capacities up t 12 tons. Hand chain hoists are built to lift as much a 40 tons.

"Easy lift, easy roll, easy steer" summarizes the qual ities of Yale Hand Lift Trucks. Because they can handl so much in a single trip, they help break productio bottlenecks. Capacities range up to 20,000 lbs. Platform pallet and tin plate models.

This Worksaver Electric Truck has a telescopic lift of 10 feet and can handle loads up to 3,000 lbs. The operator steers the truck as he walks. Lift and tilt are hydraulic. Nine other Worksaver models include high and low lift platforms, pallet and tin plate, and a tractor.

Yale Load King Scales provide the unparalleled accuracy of the exclusive MAGNETROL mechanism. They speed weighing, batching, counting, measuring and testing. There's a model for every industrial need—every type from bench to crane scales. Capacities to 60,000 lbs.

-YALE-

MATERIAL HANDLING MACHINERY · *hoists . . . hand and electric · trucks . . . hand lift and power · industrial dial scales*

Since 1887

MILWAUKEE WROT WASHERS

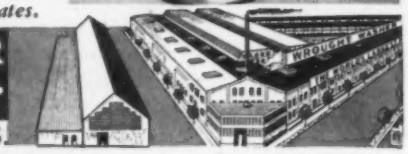
Better WASHERS ... Competitively Priced

Large volume production, the most advanced methods and facilities, plus more than 60 years of continuous experience in the manufacture of Washers, are factors that enable us to offer you top quality washers and stampings at competitive costs. Over 22,000 sets of dies for making Washers of every type (Standard and Special), from every type of material, for every purpose, in any finish. STAMPINGS of all descriptions; Blanking, Forming, Drawing. *Submit your blueprints and quantity requirements for estimates.*

WROUGHT WASHER MANUFACTURING CO.

The World's Largest Producer of Washers

2113 S. BAY ST., MILWAUKEE 7, WIS.



WILL YOUR NAME BE REMEMBERED?

GITS LIFETIME REMINDERS Quality Plastic Products

To cement friendship and esteem—to bring a warm glow of remembrance . . . give your customers and prospects a really useful reminder—a Gits Quality Plastic Product, permanently imprinted with your name and business. The cost is small . . . the value high . . . and, best of all, they won't forget!

GITS FLASHLIGHTS

Famous "Mile of Light" in three popular styles. Unbreakable plastic. "Plastic Eye" (Regular and Junior) and "Super Right Angle". Shatterproof lens. Prefocused with nickel plated solid brass reflector. Brass 3-way switch. Six permanent colors.

GITS "ONE-HAND" KNIFE

Highest quality carbon steel blade, safelocks in 5 positions. Unbreakable plastic handles in six lustrous colors.

GITS RAZOR-NIFE AND KEY CHAIN

Razor blade with a safety handle. Refillable. Assorted lustrous colors.

GITS LETTER OPENER

Transparent, with offset magnifying handle. Endurably sharp edges.

ASK your specialty jobber to show you the complete line of Gits Quality Plastic Products, or write direct, using coupon below.

GITS Molding Corporation

4640 WEST HURON ST., CHICAGO 44, ILLINOIS

COUPON

GITS MOLDING CORP., 4640 W. Huron St., Chicago 44, Ill.

Gentlemen:

☐ Please send me at once sample of the item I have checked below and prices in ..... quantity.

☐ "Plastic Eye" Flashlight
☐ "Plastic Eye Jr." Flashlight
☐ "Super Right Angle" Flashlight
☐ "One-Hand" Knife
☐ Razor-Nife and Key Chain
☐ Plain ☐ With imprint
☐ Letter Opener
☐ Nail File
☐ Thimble
☐ Stir Stix
☐ Bracelet Key Holder
☐ Shoe Horn
☐ Key Tag
☐ Match Pac

☐ The items you illustrate do not fully satisfy my needs, so please send me your complete catalog and full information.

(PLEASE PRINT)

NAME .....
COMPANY .....
ADDRESS .....
CITY ..... ZONE .. STATE .....

(*Continued from page 286*)

resin for sale to manufacturers of plastic products. The present management at Painesville will continue in charge.

Marvinol can be utilized to cover practically the entire range of uses of plastic materials from rigid sheets to pliable film forms, from clear to opaque, colored in pastel or vivid shades.

In processing, compounds of Marvinol can be calendered or extruded, or formulated into dispersions; they can be embossed and polished and have many other unusual characteristics. They are oil and water resistant, odorless, tasteless, tough, durable and fire resistant.

CARTONS IMPREGNATED WITH NOX-RUST VAPOR CHEMICAL

Announcement that it has perfected a method for impregnating chipboard and corrugated cartons with the Nox-Rust Vapor Wrapper Chemical, is made by the Nox-Rust Chemical Corporation, 2431 South Halsted Street, Chicago, Ill.

This development is said to eliminate the need for temporary rust preventive coatings and inner wrappings previously required to protect the carton from oil or grease staining. An invisible vapor released within the container prevents the formation of rust on metal. In conjunction with Nox-Rust vapor wrapper papers in rolls and sheets, the carton development makes it possible to give any type of metal product, of any shape or size, complete protect and economical protection against rust.

INDUSTRIAL USE OF THE PLATINUM METALS

"The revival of European markets for platinum metals was outstanding during 1949 as compared to other post-war years," Dr. Charles Engelhard, president of Baker & Company, Inc., New York, N. Y., stated in reviewing the platinum metals industry in 1949. "The reconstruction, modernization and expansion of European facilities for manufacturing various kinds of electrical apparatus and for making rayon, acid and other chemical products," Dr. Engelhard said, "required important quantities of platinum and palladium for electrical contacts, and for spinnerets, catalysts and other purposes. These important needs for platinum metals were augmented by a large demand for dental purposes.

(*Please turn to page 290*)

Looking for a Stainless Steel Plate as "big as the side of a house?"

THIS 3/8" PLATE IS 220-1/2" LONG, 133-3/8" WIDE. U·S·S 18-8 CB. (TYPE 347)

Come to Stainless Headquarters when your plate specifications call for sizes beyond the ordinary

● We show you this huge plate of Stainless Steel, ⅜" thick, 220½" long and 133⅜" wide, not because we consider it unusual but because there are still some plate users who are not fully aware that Stainless Steel plate in these extreme dimensions is readily available.

The fact is we have been producing such extra-large sizes for some time and can supply even larger if you need them.

So whenever your designs call for large dimension Stainless Steel plates to improve your equipment or to reduce welding costs and simplify fabrication, tell us what you need and give us an opportunity to show you how well we can meet your requirements.

Keep in mind too, that U·S·S Stainless Steel plates are produced in the complete range of standard sizes usually required by industry, in thickness from 3/16" and greater, and are available in all U·S·S Stainless Steel grades.

In whatever size furnished, U·S·S Stainless Steel plates are distinguished for their superior surface quality. Chemical composition and physical properties are reliable. Our Stainless Steel specialists will be glad to cooperate with you in applying them to your construction to insure optimum results with minimum cost.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO · CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH · TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

U·S·S STAINLESS STEEL

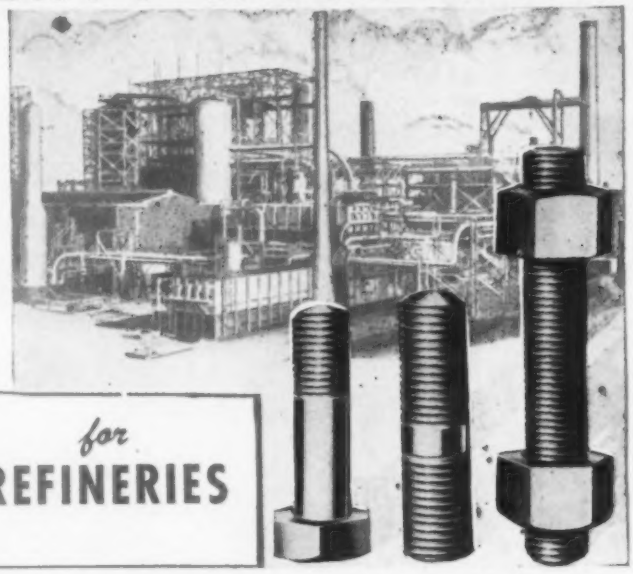
SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

O-311

UNITED STATES STEEL

ERIE SPECIAL BOLTING FOR HEAVY MACHINERY

FOR over 30 years ERIE has specialized in the manufacture of *high quality bolting*. We use the very latest equipment for heat treating, machining, grinding and threading. We are certain that we can produce better bolting at a saving to you because we are specialists — send us your bolting specification for our estimate.



for REFINERIES

A DEPENDABLE SOURCE OF HIGH QUALITY BOLTING FOR RAILROADS, REFINERIES, DIESELS, FARM MACHINERY, EXCAVATING EQUIPMENT AND ALL TYPES OF HEAVY MACHINERY.

ERIE BOLT & NUT CO.
ERIE, PA.

A SUBSIDIARY OF Barium STEEL CORPORATION Steelwright to the Nation

STUDS • BOLTS • NUTS ~ ~ ALLOYS • STAINLESS • CARBON • BRONZE

Representation in Principal Cities

Now! GET ALL LEATHER GLOVES WITH
SEAMS THAT DEFY ACID

1. BETTER BECAUSE they're sewn with acid resistant thread.
2. BETTER BECAUSE they're made of smooth, all leather side horsehide.
3. BETTER BECAUSE no fiberous leather lint to contaminate chemicals.
4. BETTER BECAUSE seams won't give away to acid, assuring full life to the glove as in the leather itself.
5. PROVEN BETTER by 20% to 30% by one of America's foremost chemical manufacturers.

Other gloves available besides side horsehide. If you've a particular glove problem write, Illinois' "Special Glove Department" stating fully your needs. We are equipped to make gloves to fill the most exacting specifications.

It's revolutionary . . . a glove with seams that will last as long as the leather itself because they're sewn with acid resistant thread. Banish forever that costly habit of discarding gloves before they're worn out. Get all the wear from every pair.

ILLINOIS GLOVE CO
CHAMPAIGN, ILL

WRITE FOR SAMPLES

(*Continued from page* 288)

Europeans are using dental bridgework made of casting alloys containing 20% to 40% palladium."

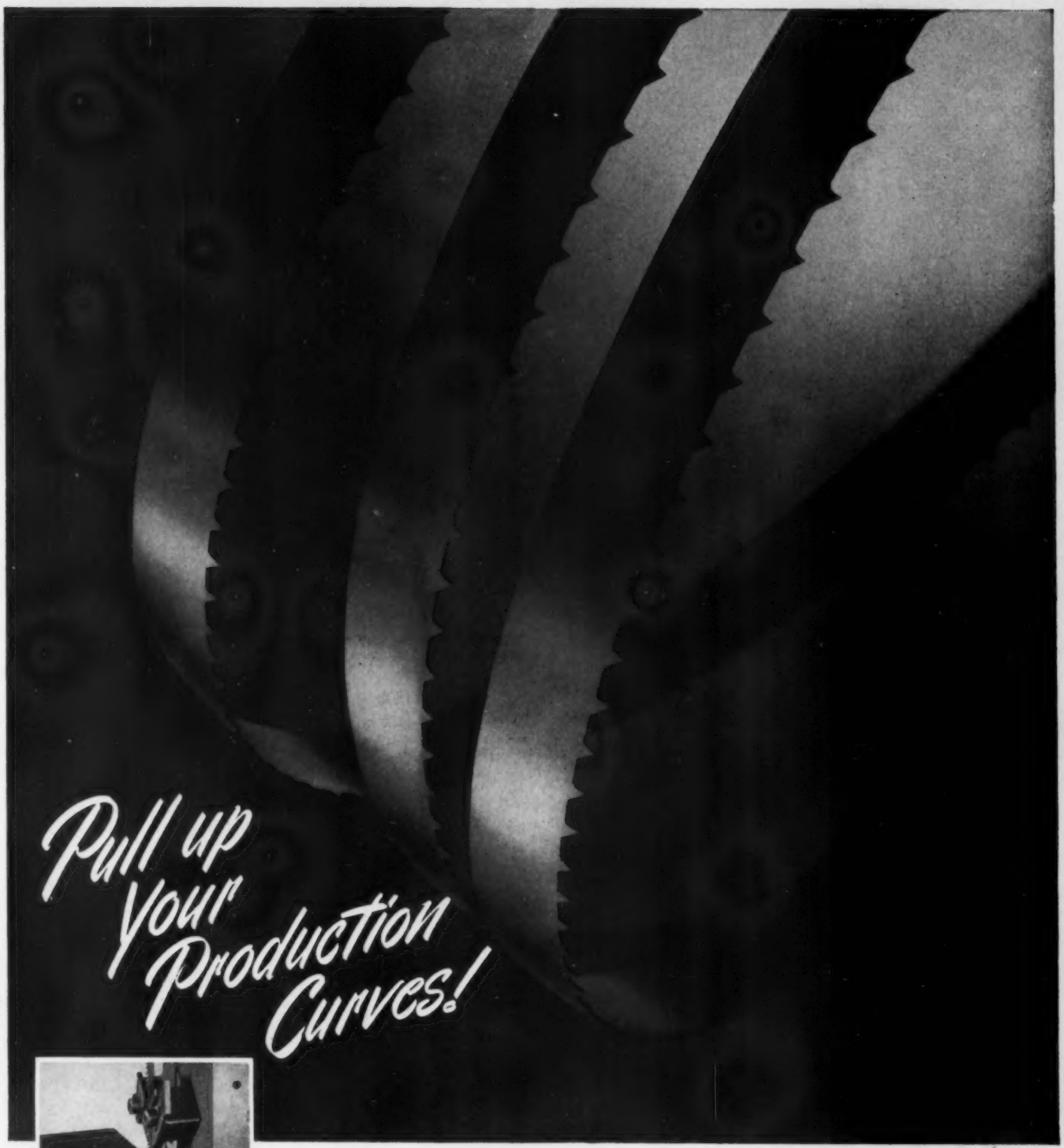
"In the United States the industrial use of platinum metals for electrical and chemical purposes exceeded their uses for jewelry and decorative purposes," he continued. "Platinum metals are chosen for industrial purposes for their economy, which involves exceptional performance and high salvage value. These factors are receiving more attention from chemical engineers than ever before. During 1949 processing equipment of good size was constructed of platinum, or lined with thin layers of platinum, using improved fabrication methods. This type of apparatus is used to advantage in handling corrosive materials and in carrying out difficult chemical reactions, especially when high temperatures or high pressures are involved.

"A noteworthy development in the past year has been the use of platinum and palladium catalysts in new production processes. For example, 'platforming,' a new refining method for producing gasoline with high octane rating, is done with the aid of platinum catalyst. Already past the experimental stages, a production plant using this new process is under construction. Palladium catalysts are playing an important role in the manufacture of the newer antibiotics, developed after penicillin."

"The electrical industry continues to be an important consumer of platinum metals," Dr. Engelhard said. "Tiny contacts of platinum and palladium are used in great numbers in telephone equipment, thermostatic controls and other household conveniences, and in a wide variety of industrial devices. The use of platinum for electrodes in aircraft sparkplugs has become general throughout the world. Platinum is being used even in miniature glow-plugs used to start tiny diesel engines in model airplanes.

"The use of rhodium, one of the six platinum metals, for decorative purposes has made much progress during the year. Rhodium-plated lighters, razors and various other articles are being offered. A brilliant finish is obtained by electro-plating a thin layer of rhodium onto the article. Rhodium does not tarnish and electroplated rhodium is much harder than electroplated gold or silver.

"Canada continues to be the leading source of the platinum metals, which are supplied also by South Africa, Colombia and Alaska. The production facilities in South Africa were expanded during 1949. Little is known about the platinum metals' production of Russia which was not an important supplier of platinum metals to world markets during 1949. The statistics on United States imports of platinum metals show that none of the platinum metals were imported from Russia during the year. In previous years large quantities of platinum and palladium were received from Russia."



Use SIMONDS Metal-Cutting Band Saws

These tough blades start life with a steel of special analysis. The Skip-Tooth Saw shown gives outstanding performance in cutting non-ferrous metals and composition materials at high speeds and feeds. But whether your requirements are for skip-tooth or regular-tooth saws on horizontal or vertical machines, you are assured of evenly milled, perfectly shaped teeth, with heat-treatment controlled for maximum efficiency. Have your Industrial Supply Distributor recommend the right Simonds Band Saw for YOUR job. Call him today!

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.
Other Divisions of SIMONDS SAW AND STEEL CO. making Quality Products for Industry

SIMONDS — Special Electric Furnace Steels
SIMONDS — Grinding Wheels and Grains
SIMONDS — Simonds Products for Canada

Purchasing Organic Coatings

(*Continued from page* 141)

to telephone a coating engineer—and thus confirmed a suspicion that an excessive use of drying agents could cause normally good enamel finishes to crack. Then he hurried to the finishing department, asked a few pertinent questions, and soon learned that the rejections could be attributed to a recently-promoted supervisor who, innocently enough, thought extra quantities of drier would boost production.

Similar difficulties have been frequently experienced by new users of electrostatic spray equipment—simply because operating personnel couldn't believe that such high-speed production units were designed to make use of comparatively "thin" or slow-drying coating materials (sprayed particles of which are subjected to unusually fast drying action due to the relatively long period of time during which they are electrically-charged and attracted to deposition surfaces).

Product of Imagination

In at least a few companies, a generous use of imagination has sometimes enabled defective coating materials and practices to be converted into actual advantages. For example, Paramount Furniture Company of Portland was recently confronted with the problem of replacing some $1,500 worth of war-surplus coating materials which revealed an uncontrollable tendency to crystallize after they were applied to wood desks and chairs; then Purchasing Agent Braden Somerfield noticed that the crystallized finishes had a sort of "antique" appearance, and suggested that they might become acceptably durable if glazed with a finish coating of clear lacquer. Somerfield's idea was soon proved to be practical, and the resultant antique finishes won popular approval with such speed that Paramount sales increased almost 25% during the business recession which took place in the early months of 1949.

Thanks to the publicity buildup that was concentrated on plastics due to the material shortages of World War II, the organic coating industry has acquired a few unscrupulous firms which resell standard materials under new trade names—advertising themselves as manufacturers, and making unsupportable claims with regard to the virtues of their "plastic" coating materials, in

(*Please turn to page* 294)

HODELL

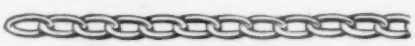
IS THE NAME FOR DEPENDABLE

CHAIN

Whatever your chain requirements, you can depend on the name "Hodell" for top quality and long life. A few of the many types of Hodell Chain are shown below. Hodell also manufactures many formed wire specialties and can make your chain assemblies to your specifications.

PROOF COIL
Trade sizes 3/16 and up

LIBERTY COIL
Twist or Straight Link. Sizes No. 6 to No. 7/0



LIBERTY MACHINE
Twist or Straight Link. Sizes No. 5 to No. 7/0

PASSING LINK
Sizes No. 2/0 to No. 4/0

BULLDOG COIL
Sizes No. 7 to No. 10/0

SAMSON COIL
Sizes No. 4 to No. 7/0

SINGLE JACK — STEEL OR BRASS
Sizes No. 24 to No. 5

DOUBLE JACK — STEEL OR BRASS
Sizes No. 24 to No. 10

Send for Industrial Catalog...
giving full information on the complete Hodell line.

HODELL CHAIN COMPANY
• CLEVELAND 3, OHIO •
ESTABLISHED 1886 — A division of THE NATIONAL SCREW & MFG. COMPANY

A gauge for every need... *each the best of its kind*

Three basic groups of Marsh Gauges are shown here:

- The "Standard" group for the general run of gauge services.
- The "Quality" group for tougher service conditions.
- The "Mastergauge" group for the most extreme conditions.

While there is a considerable difference in the design and construction through these groups, the choice of a Marsh Gauge for a given application depends squarely upon the *service condition.*

This is because all Marsh Gauges — from lowest price to highest price — are high quality gauges. Each group or series contains the *best gauges of their kind.*

That is why you should use Marsh Gauges. Select the right Marsh Gauge and you use the most *economical* gauge for your requirement. We will help you select it.

Write for New Catalog.

MARSH INSTRUMENT CO.

Sales affiliate of JAS. P. MARSH CORP., DEPT. G, SKOKIE, ILLINOIS

MARSH GAUGES

THE STANDARD OF ACCURACY

JOHNSON is a wire specialty plant, not a tonnage mill. Every Johnson wire is drawn under close laboratory supervision, resulting in the specific wire for its intended use. Whether it be Music Wire—"The wire of a thousand uses"—or wire that is to be devoted to the enhancement of the lady beautiful (bobby pin wire, brassiere wire, or corset stay wire), Johnson goes in for top quality and ease in processing. For example, Johnson Stainless Steel (18-8 grade, types 302 and 304) comes to you with lasting harmless lubrication *(not to be removed)*.

Whatever your requirements in high tensile wire, let Johnson specialists go to work for you. You will find that the time saved in processing, less down-time, and the reliability of your production will be well worth while.

JOHNSON
STEEL AND WIRE CO., INC.
WORCESTER 1, MASS.

NEW YORK PHILADELPHIA CLEVELAND DETROIT AKRON CHICAGO
ATLANTA HOUSTON TULSA LOS ANGELES TORONTO

Purchasing Organic Coatings

(Continued from page 292)

order to obtain quick and inordinately large profits. Generally speaking, these concerns operate within the outer fringes of the law and victimize unwary laymen—not industrial organizations with competent purchasing personnel. However, even the most experienced P. A. must sometimes take extreme precautions to distinguish the sharpers from small coating manufacturers who are endeavoring to do business in an ethical manner.

Lawrence Moad of Ranier Manufacturing Company has worked out what seems to be a foolproof routine for the purchase of orangic coatings, and explains it as follows:

"First of all, we make it a practice to patronize established companies whose reliability is above reproach whenever we have optional sources of materials. But when we have reason to believe that we can obtain a better coating product from a new or unknown concern, our usual procedure is to order a small sample of the product so that we can compare its performance with the known qualities of standard products. Then, if the sample appears to have the desired advantages, we request quantity price quotations so that further comparisons can be made with regard to costs. This latter procedure is extremely important, because the price differentials for organic coatings of any given type are not normally great—and because unscrupulous resale firms usually charge much more than reputable manufacturers.

"In one case, we were on the verge of buying a new-type varnish when we learned that its cost was almost 50% higher than the prices of competitive varnishes. It happened to be one of those products we needed regardless of cost, but we decided to delay our purchase order long enough to send out a form letter wherein we asked various manufacturers whether they could provide a comparable material.

"Within a week, we had an affirmative answer from one of the large eastern concerns—stating that they had developed a product of the type we specified, but couldn't recommend it as a portion of their advertised coatings until its value was proved by sales to a limited clientele and practical usage. We obtained a sample of the latter product, and found that it was precisely the same as the varnish whose price we questioned—that is, aside from the fact that its cost was approximately 40% lower."

Eaton Permanent Mold Gray Iron Castings

for
HIGH PRESSURE
CONTROL
MECHANISMS

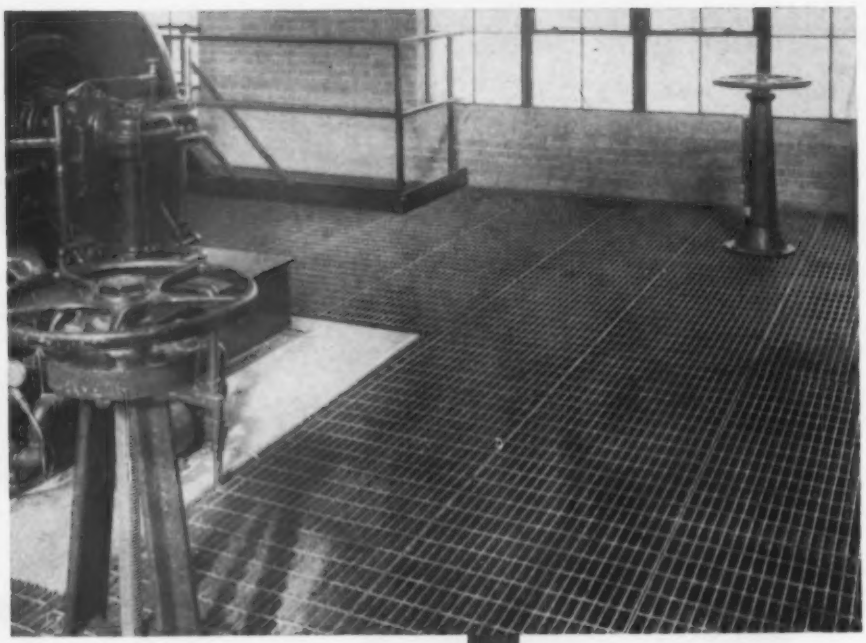
- Free machinability
- Dense, homogeneous structure
- Freedom from leakage under pressure
- Machines to high, mirror-like finish
- Properly annealed; no growth or distortion after machining

Send for your copy of the illustrated booklet, "A Quick Picture of the Eaton Permanent Mold Process for Producing Gray Iron Castings."

EATON MANUFACTURING COMPANY
CLEVELAND, OHIO
FOUNDRY DIVISION: 9771 FRENCH ROAD • DETROIT 33, MICHIGAN

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

the IDEAL OPEN FLOOR for every industry!



IT'S Blaw-Knox *Electroforged* Steel Grating . . . with all the features to meet your requirements for open flooring. *Exceptionally strong,* electroforged into one solid, permanent piece. *Safe,* sure footing with the non-slip twisted bar. *Maximum open area* for good ventilation and light. *Self-cleaning,* no sharp angles or corners to clog. *Easily installed,* simple to cut and band for fitting around obstacles with no loss of strength. *Easily maintained,* paint reaches entire surface. *Adaptable* to many uses, indoors and out, for every industry.

Remember, whenever you need steel grating, be sure to SPECIFY BLAW-KNOX.

MEETS ALL ENGINEERING REQUIREMENTS FOR

- Open Flooring
- Sidewalk doors
- Bridge surfacing
- Catwalks
- Subway grating
- Sidewalks
- Stair treads
- Many other uses in every industry

Blaw-Knox Electroforged Stair Treads. Tremendous strength against impact. Three types available: Rolled diamond checker plate nosing (illustrated), twisted crossbar nosing, or abrasive nosing.

SEND FOR NEW BULLETIN

Get complete details of all the superior features that make Blaw-Knox Steel Grating the best buy for your requirements. Write for your copy of Bulletin 2296 today!

BLAW-KNOX DIVISION of Blaw-Knox Company

2075 Farmers Bank Bldg., Pittsburgh 22, Pa.
Offices in Principal Cities

BLAW-KNOX ELECTROFORGED STEEL **GRATING**

Does Money Grow on Trees?

(*Continued from page* 135)

ests could be made to produce about fifty times their present volume of end-products and still remain a permanently self-renewing source for our raw material supplies.

To reach such a goal we need to put into effect a comprehensive national forest program that would make what we have last longer and insure a permanent supply. It is a national problem, and is the Government's responsibility in the common interest.

The first steps seem to be:

1. Assist the private forest grower with professional advice on how to cut his trees; how to protect from fire; how to replant denuded land.
2. Set up public control of forest practice to keep the lands productive.
3. Encourage the complete integration of forest industries to eliminate the enormous waste occasioned by separated processing.

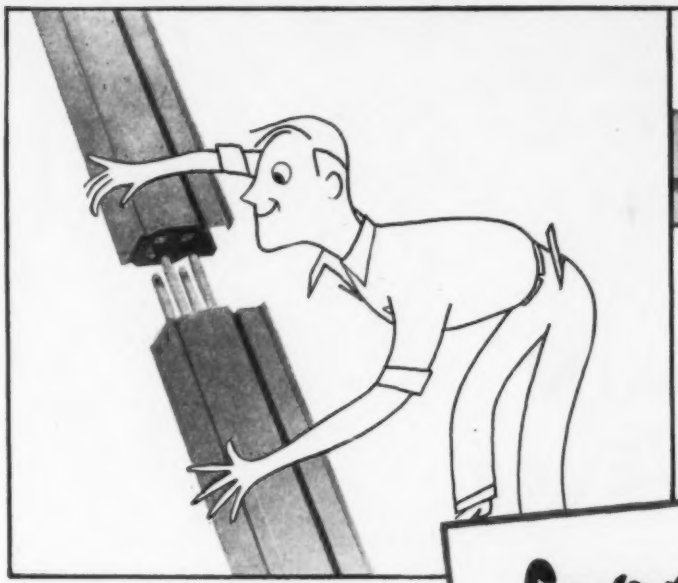
The greatness of America has been largely based upon our abundant natural resources. Our future will be also. It will prove to be the better part of prudence to keep our wood-pile high.

While government intervention will not automatically mean the best and widest use of forests, it is generally recognized that government forests are usually better managed than private ones. But whatever the legal status of a potential output of 9,000 million acres of forest land in the world, Dr. Glesinger concludes that it can end the chronic scarcities of material goods that have harassed man's existence since his beginning.

After a long succession of disaster warnings in books and commentaries, it is comforting to encounter a confirmed optimist. Dr. Glesinger's book is exciting reading and should interest purchasing agents who buy so many of the things that have their origin in trees.

After reading it one can say with seriousness and absolute truth: "Money does grow on trees."

YOU WILL FIND NEW SUPPLY-SOURCES LISTED EVERY MONTH IN PURCHASING'S CLASSIFIED SECTION! SEE PAGE 310



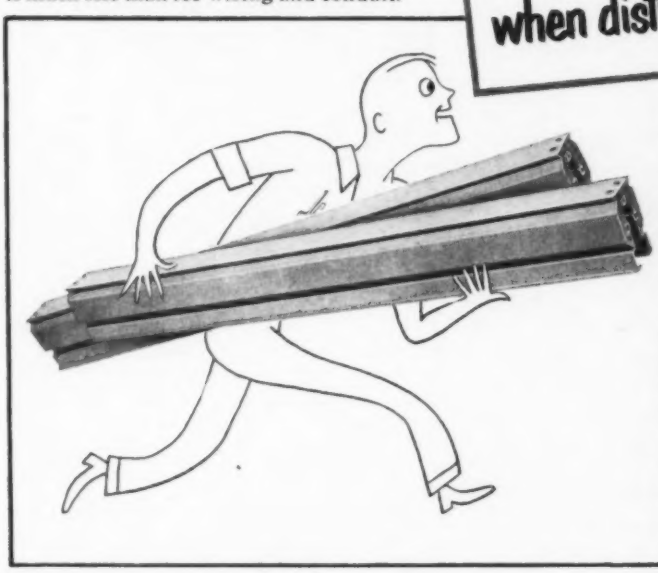
Save money these 3 ways when distributing power

"Quick-install-ability" saves initial cost

LTG FLEX-A-POWER busways are pre-fabricated housings which are easily coupled in any arrangement and in runs of any required length. Time for installing is much less than for wiring and conduit.

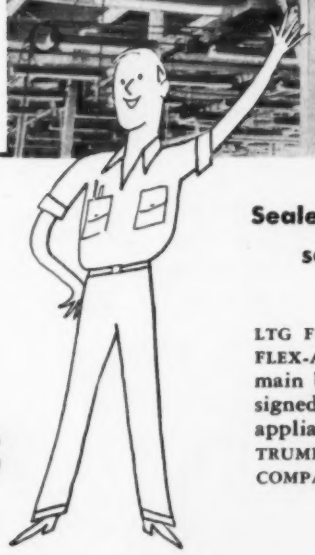
"Plug-in-ability" saves time relocating machines

Take-off plugs or trolley can be inserted anywhere (no drop-out section needed for trolley). You can add or relocate loads without rewiring expense and without long extensions.



"Take-apart-ability" saves material expense

Whenever a *major* relocation of outlets is required, the entire FLEX-A-POWER system can be dismantled, removed to another location and re-installed with practically 100% re-use of materials.



Sealed Power Corp. saves with Flex-a-Power

LTG FLEX-A-POWER, one of six forms of FLEX-A-POWER for various services from main breakers to individual loads, is designed for light-duty lighting, small tools, appliances. Write for Bulletin TEC-3, THE TRUMBULL ELECTRIC MANUFACTURING COMPANY, Plainville, Conn.

TRUMBULL (T) ELECTRIC

TRUMBULL'S TRAIN OF NEW PRODUCTS

Mr. P. A.

Let's look at CHAIN Through Your Eyes

You see chain in terms of *the job it is to do*. So do we. We make chain for every industrial application. We know what is expected of it. We make sure it will completely meet your every requirement for strength—utility—and long wear.

You see chain in terms of *dependability*. So do we. We have been making all types of chain for nearly half a century—ranging in size from light dog leads to heavy anchor chains.

We subject every length of chain to the most thorough testing and inspection. We maintain rigid laboratory control over every process. We are continuously trying to improve it wherever possible. We stand solidly behind every link we sell.

Whatever your need, you will always find Campbell Chain expertly designed—carefully made—fully guaranteed.

We are also prepared to counsel with your engineers on jobs involving unusual chain problems, and can supply you with chain made to any desired specification.

CAMPBELL CHAIN *Company*

(INTERNATIONAL CHAIN & MFG. CO.)

York, Penna.

INDUSTRIAL • MARINE • FARM • AUTOMOTIVE

Coordination for Control of Engineering- Purchasing- Production

(*Continued from page* 105)

to Tool Engineer Bruckman in Mr. Kelly's office. He prepares the indicated work orders, also purchase requisitions after having probably received several answers to quotation inquiries. In the matter of buying items of capital investment such as new machine tools, the justifying evaluation follows much the same process as that on tooling. After every pro and con has been carefully passed on, and the pros have it, the complete story is referred to top management for final decision.

For a company with nearly 1,000 employees and a large production of so many different units made up of a great variety of component parts there is a minimum of executive and supervisory personnel. This is due to the strong pattern of cooperation (and, of course, the quality of the personnel). This pattern is strengthened and the functioning of each of these men in his job, is made more easy by giving them, promptly, and in organized, clean-cut form, every bit of operating information that can in any way concern them, so that each may contribute his bit or large portion towards maintaining the smooth flow of efficient production. Thus there is little waste of time and energy in back-tracking or having to work with inaccurate, incomplete or dilatory information.

Mr. Kouf is thus enabled to operate his department with no other assistance than his secretary, Treva Carr, and Buyer C. A. Keesling, who makes most of the purchases not involving raw materials or parts manufactured for General Controls. The integration of Mr. Kouf's own activities and other purchasing department functions, with engineering, production and materials control, and sales engineering, provides him with a maximum knowledge of what goes on in any phase that might in any way concern him and his department. It all adds up to the best in procurement engineering.

* * *

Purchasing Textiles

(*Continued from page* 110)

comes only into the enforcement part of arbitration awards, which have the legal effect of a court judgment. Arbitration is an established and recognized practice of the textile trade, and is handled in an orderly manner by reputable organi-

(*Please turn to page* 300)

"Around here, we never waste a dime"

"We check the cost of everything. Compare brands, run tests. Wire rope? Sure we check on rope — performance, life, costs of the actual work it does. That way, it's possible to tell which brand is cheapest in the long run."

Smart buyer! His records have shown him that cost per unit of work, not purchase price, is the only sound basis for calculating rope expense.

His records have shown him, too, that whenever he specifies Bethlehem rope, he's making a solid buy . . . one that will give him his money's worth and more. There's no finer rope made — a fact that you yourself can easily verify.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

When you think WIRE ROPE . . . think BETHLEHEM

What's in a Package?

Eye-Compelling attractiveness obtained with Cleveland Containers means increased sales.

WRITE US TODAY FOR A COPY OF OUR NEW FOLDER. It identifies and illustrates the various types and sizes of Cleveland Containers.

Visit Our BOOTH NO. 208 at the 19th Natl. PACKAGING EXPOSITION in Chicago

It tells how samples may be easily obtained and our plan of helping manufacturers to improve the packaging of their products.

The CLEVELAND CONTAINER Co.
6201 BARBERTON AVE. CLEVELAND 2, OHIO
• All-Fibre Cans • Combination Metal and Paper Cans
• Spirally Wound Tubes and Cores for all Purposes
PLANTS AND SALES OFFICES: Cleveland, Detroit, Chicago, Plymouth, Wisc., Jamesburg, N. J., Ogdensburg, N. Y. • ABRASIVE DIVISION at Cleveland
SALES OFFICES: Grand Central Terminal Bldg., New York City; Washington Gas Light Bldg., Washington, D. C.; West Hartford, Conn.; Rochester, N. Y.
Cleveland Container Canada, Ltd., Prescott, Ontario • Offices in Toronto and Montreal

Ask for a copy of our No-Lap Catalog on Abrasive Sleeves, Drums and Belts.

Purchasing Textiles

(*Continued from page 298*)

zations such as the National Federation of Textiles, Inc. As textile matters are often technical in nature and depend largely upon trade practice and custom, the use of arbitrators experienced in textile business is thought more desirable than judge and jury, who are laymen so far as textiles are concerned.

Textile yarns are usually sold on a moisture or oil basis. Silk, for example, is sold on the basis of 11% moisture, and wool with 15% oil content. If wool costs $3.50 per pound, the deviation of 5% in oil content is not a trifling matter. The weights of textiles yarns and fabrics can be checked officially by sending an unbroken case or package to an accredited testing company. Such organizations are also equipped to make all sorts of textile tests—strength of fabrics, yardage, cloth construction count, etc. The various textile trade associations publish association standards, and there are standards set by the American Society for Testing Materials, and the American Association of Textile Colorists and Chemists. If fabrics are sold with washable fastness of colors, and the colors run when put into the home laundry, the standards of wash-fastness become of considerable importance in ascertaining defective cloth deliveries.

Cloth is frequently sold according to a sample, in which case it is good practice to fasten the sample to the contract as a means of identification. Later, check can be made as to the color match, cloth construction, and other features.

The purchaser of textiles should know something of the end-use of the material purchased, as this will greatly facilitate proper buying. If the fabric is to be used where heat is present, should it be fireproof and non-inflammable? If water is present, should the fabric be waterproof or water-repellant? If water-repellant, is the fabric to have a durable or renewable water-repellant finish? Should the color be fast to light, or water, or perspiration, or washing? What strength or durability performance is expected of it? Is the fabric to be incorporated in an item to be used in the tropics, and hence should it be mildew-proof?

If the fabric is to be used as a lining in a wool suit, it will not be washed, hence it does not need to be dyed in a color fast to washing; a cheaper type dye can be used. If it is not to be exposed to light, as in a

(*Please turn to page 302*)

It's PURDY for ALUMINUM and all ALUMINUM ALLOYS

INVENTORY is our business!

Full stocks of specification sheets and coils, utility sheets and a complete range of alloys are available at all times for fast delivery. Complete warehouse service including precision slitting and shearing of all gauges and sizes.

Mr. P. A.—
GET THE LITERATURE FOR YOUR SHOP MAN!

A. R. Purdy Co.
INC
LYNDHURST, NEW JERSEY

TELEPHONES:

LYNDHURST:	RUtherford 2-8100
NEWARK:	HUmboldt 2-5566
NEW YORK CITY:	CHelsea 3-4455
CONNECTICUT:	Enterprise 6400
SYRACUSE:	Enterprise 6400
ROCHESTER:	Enterprise 6400
TELETYPE:	Rutherford N. J. 79

Yes, we are interested in lowering our costs, improving our product. Please rush data on NEW 150S ALUMINUM ALLOY at once to:

NAME_____ TITLE_____

COMPANY_____

STREET ADDRESS_____

CITY_____ STATE_____

Triple Threat to Production Problems

Chips are actually cut from material.

HOLTITE "TAP" SCREWS

U.S. Pat. No. 2,292,195 Other Patents Pending

This newest cost-cutting innovation eliminates tapping operations by actually tapping its own perfect mating threads in any material. The slot, corresponding to the flutes of a tap, provides two balanced cutting edges that actually remove material, and a chip reservoir that allows chips and cuttings to free themselves readily. Combining the cutting action of a tap with the economy of a screw this dual purpose fastening has solved innumerable production problems. Now available in 420 Stainless Steel, heat treated. Send for illustrated folder.

HOLTITE "LOCK-TITE" SCREWS

U.S. Pat. No. 2,226,491

As the lock washer is an integral part of the head, this economy fastening automatically eliminates lost time, waste and difficulties of handling separate lock washers. "Lock-Tite" screws are made to meet specific needs of user. Design of teeth, type of metal, hardening and tempering can be regulated to obtain the most efficient locking or binding action required for the application.

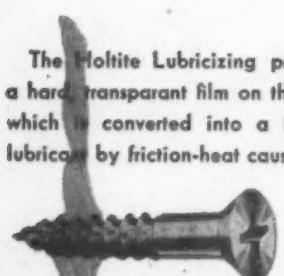
Unretouched photo shows progressive "locking bite" of washer teeth as screw is driven in. When setup, screw head is securely anchored in the material to effect a tighter, stronger, vibration-resisting fastening.

HOLTITE Lubricized

Reg. U.S. Pat. Off.

WOOD SCREWS · HANGER BOLTS
SHEET METAL SCREWS

The Holtite Lubricizing process produces a hard transparant film on the screw surface which is converted into a highly efficient lubricant by friction-heat caused through driving. When cool, this lubricizing agent again solidifies setting the screw securely in the fibres of the wood. Eliminating time-wasting hand lubricants, this processing efficiently reduces binding and breaking when fastening in hard woods and in difficult applications.



CONTINENTAL SCREW CO.

New Bedford Mass., U.S.A.

Purchasing Textiles

(*Continued from page* 300)

shoe lining fabric, there may again be an opportunity for saving. But as both suit linings and shoe linings are in contact with perspiration, it is important that perspiration-proof dyes be used. Generally, the textile supplier can aid in proper buying of textiles with a view to end-use if he is consulted.

In checking textile deliveries, there are various ways of handling the problem. A weaving manufacturer makes an individual check on every case of yarn received, with a monthly check of one case sent to a testing laboratory. The textile converter checks the yardage, and inspects the color and finish of cloth received from the dyer. The bathing suit manufacturer will probably wash a sample of cloth to see if the dye bleeds or runs in water, and may make some tests of exposure to sunlight before he uses the cloth. There are even simpler tests that can be made on samples taken from a delivery of textiles. An experienced buyer, by pulling at the edge of the cloth, can judge its slippage, a factor controlling the ability of the fabric to hold a sewn seam.

The purchaser of textiles must accustom himself to the methods, practices, and customs of the textile trade, which have grown up and become established through years of use. The peculiarities of the trade arose from the complexity of textile processes, which is carried over into all phases of its merchandising and distribution.

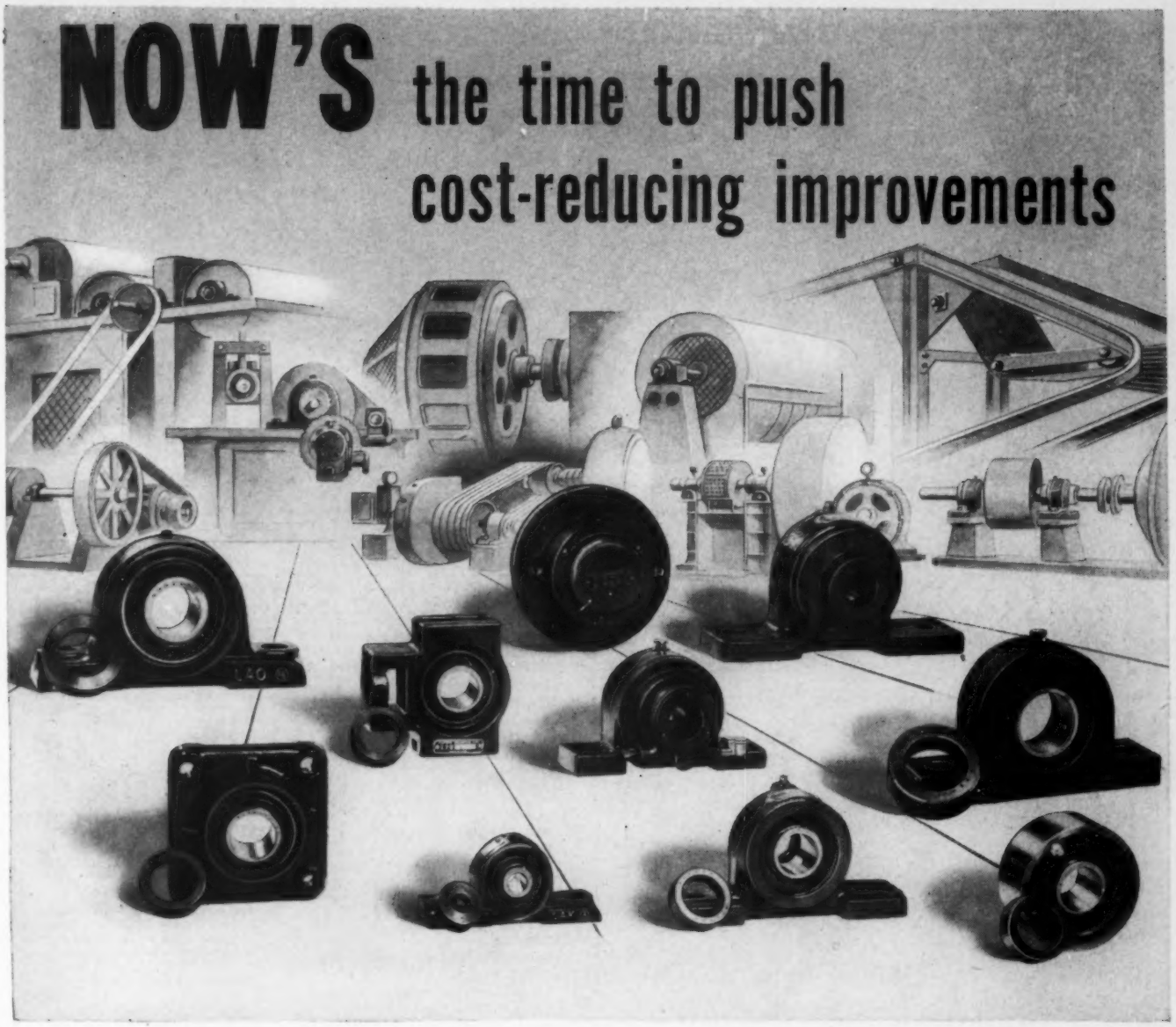
* * *

TABLES OF THE CONFLUENT HYPERGEOMETRIC FUNCTION

Both theoretical and applied statisticians, as well as persons working in industrial quality control, will be interested in recent publication of extensive tables of the confluent hypergeometric function $F(n/2, \frac{1}{2}; x)$ and related functions. These tables prepared by the National Bureau of Standards, are now available from the U. S. Government Printing Office as a 73-page booklet. The new tables, with their wide range for x from 0.10 up to 100 and for odd values of n from 3 up to 201, will provide a basis for more efficient use of analysis-of-variance tests than has heretofore been possible.

National Bureau of Standard Applied Mathematics Series 3, *Tables of the Confluent Hypergeometric Function F (n/2, ½; x) and Related Functions*, 73+ XXII pages, is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 35¢ a copy.

NOW'S the time to push cost-reducing improvements



Single Pillow Blocks, light, standard and heavy series . . . self-aligning and floating types. **Double Pillow Blocks,** standard and heavy series, self-aligning. **Cartridges,** cylinder, flange and motor. **Take-Up Units,** with self-aligning ball bearings. Matching take-up frames available. **All** incorporate the famous Fafnir Wide Inner Ring Ball Bearing with exclusive Self-Locking Collar which makes them easiest of all to install and remove.

EXAMPLE...

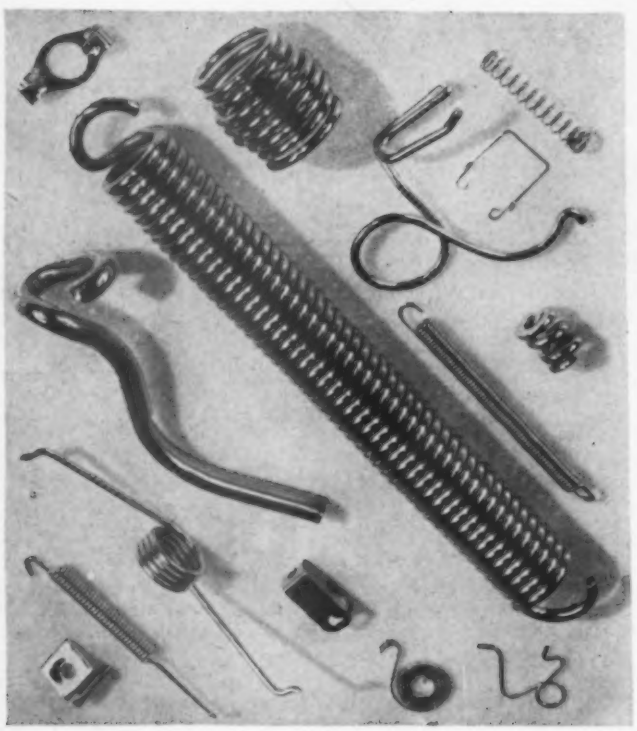
This $3\frac{15}{16}$" Heavy Duty Fafnir Ball Bearing Pillow Block has chalked up an excellent service record on this 140 h.p. diesel engine drive. Let your Fafnir distributor suggest time- and money-saving installations for your "sore spots".

There's no better time than right now to reduce maintenance costs, save power and speed up machines. Replace oil-dripping, labor-taking, power-wasting plain bearings with Fafnir Ball Bearing Transmission Units. Time after time, these modern anti-friction bearings have paid for themselves within a single year. Today, call your Fafnir distributor . . . for recommendations, for complete service, for fast delivery. The Fafnir Bearing Company, New Britain, Conn.

FAFNIR

BALL BEARINGS

MOST COMPLETE LINE IN AMERICA



• One of the things our customers find most valuable is the ***service*** we give them when they have a spring problem. Whether it's a problem of application, cost or supply, you get our wholehearted cooperation in finding the best solution. You can count on this service as an asset of doing business with U. S. Steel Wire Spring.

No order too large or too small

The U. S. STEEL WIRE SPRING Co.
7800 FINNEY AVE. • MICHIGAN 6318
CLEVELAND 5, O.

Distributors of

Kimwipes*

Industrial Wiping Tissues

ALABAMA
Graham Paper Co. . . . . Birmingham
Jefferson Brick & Supply Co. Birmingham

ARIZONA
Blake Moffitt & Towne . . . . . Phoenix, Tucson
Graham Paper Co. . . . . Phoenix
Zellerbach Paper Co. . . . . Phoenix

CALIFORNIA
Blake, Moffitt & Towne . . . . Fresno Oakland, Sacramento, San Francisco, Los Angeles, San Bernardino, San Diego, Santa Rosa, San Jose, Stockton Long Beach
Zellerbach Paper Co. . . . . Fresno, Los Angeles, Oakland, Sacramento, San Diego, San Francisco, San Jose, Stockton

COLORADO
Carpenter Paper Co. Denver, Pueblo
Graham Paper Co. . . . . Denver

CONNECTICUT
Charles F. Hubbs & Co. . Bridgeport
The Rourke-Eno Paper Co. . Hartford

DISTRICT OF COLUMBIA
Kern Distributing Co., Inc. Washington

FLORIDA
Graham-Jones Paper Co. . . . . Jacksonville, Tampa

GEORGIA
Graham Paper Co. . . . . Atlanta
Harris-Seybold Co. . . . . Atlanta
National Paper Co. . . . . Atlanta

IDAHO
Blake, Moffitt & Towne . . . . . Boise

ILLINOIS
Abana Products . . . . . Chicago
Bradner Smith & Co. . . . . Chicago
Graham Paper Co. . . . . Chicago
Knox & Schneider Ppr. Co . Chicago
S. V. Cain, Inc. . . . . Peoria

INDIANA
Crescent Paper Co. . . . Indianapolis

IOWA
Carpenter Paper Co. . . Des Moines, Sioux City

KANSAS
Carpenter Paper Co. . . . . Topeka
Graham Paper Co. . . . . Wichita

KENTUCKY
Graham Paper Co. . . . . Louisville

LOUISIANA
Graham Paper Co. . . . New Orleans

MAINE
Carter Rice & Co. Corp. . . . . Augusta

MARYLAND
Hubbs & Corning Co. . . . Baltimore
Utility Products . . . . . Baltimore

MASSACHUSETTS
Carter Rice & Co. Corp. . . . . Boston
H. J. Dowd Co., Inc. . . . Cambridge
Charles A. Esty Paper Company . . . . . Worcester
Bulkley, Dunton & Co., Inc. . . . . Springfield

MICHIGAN
The Whitaker Paper Co. . . . . Detroit
Beecher, Peck & Lewis . . . . . Flint
Graham Paper Co. . . Grand Rapids
Crown Paper & Bag Co. . . Jackson
Bermingham & Prosser Company . . . . . Kalamazoo
The Weissinger Paper Company . . . . . Lansing
Reid Paper Co. . . . . Saginaw

MINNESOTA
Graham Paper Co. . . . . Minneapolis
Carpenter Paper Co. . . Minneapolis, St. Paul

MISSOURI
Carpenter Paper Co. . . Kansas City
Graham Paper Co., N. Kansas City, St. Louis
Prunty Seed & Grain Co. . . St. Louis
Smith-Scharff Paper Co. . . . St. Louis

NEBRASKA
Carpenter Paper Co., Grand Island, Lincoln, Omaha

NEW MEXICO
Carpenter Paper Co. . . . Albuquerque
Graham Paper Co. . . . . Albuquerque

NEW YORK
Hubbs & Howe Co. . . . . Buffalo, Niagara Falls
Hubbs Paper Co., Inc. . Mineola, L.I.
Charles F. Hubbs & Company . . . . . New York
Herbert A. Post, Inc. . . . . New York
Heller & Usdan, Inc. . . . New York
The Alling & Cory Co. . . Rochester
J. & F. B. Garrett Co. . . . . Syracuse

NORTH CAROLINA
Southern Paper Products Co. . . . . Asheville
Henley Paper Co. . . . . High Point Gastonia, Charlotte

OHIO
Millcraft Paper Co. . . . . Akron
The Chatfield Paper Corp. . . . . Cincinnati
The Whitaker Paper Co. . Cincinnati
Hubbs & Howe Co. . . . . Cleveland
Reese-Edwards Paper Co. Cleveland
The Sciato Paper Co. . . . . Columbus
The Ohio & Michigan Paper Company . . . . . Toledo

OKLAHOMA
Carpenter Paper Co. of Okla. . . . . Oklahoma City
Graham Paper Co. . Oklahoma City
Tulsa Paper Co. . . . . Tulsa

OREGON
Blake, Moffitt & Towne . . . . Portland
Zellerbach Paper Co. . . . . Portland

PENNSYLVANIA
Hubbs & Howe Co. . . . . Erie
Morris Paper Co. . . . . Johnstown
J. L. N. Smythe Co. . . . Philadelphia
D. L. Ward Co. . . . . Philadelphia
The Chatfield & Woods Co. of Pa. . . . . Pittsburgh
Williamsport Paper Co. . . . . Williamsport

RHODE ISLAND
Carter Rice & Co. Corp. Providence

TENNESSEE
Graham Paper Co. . . . . Memphis, Nashville
Wurzburg Bros., Inc. . . . . Memphis, Nashville

TEXAS
Graham Paper Co. . . Dallas, El Paso, Houston, San Antonio
Carpenter Paper Co. . . . Fort Worth, Dallas, San Antonio, El Paso
Harris-Seybold Co. . . . . Dallas

UTAH
Carpenter Paper Co. Salt Lake City Ogden
Zellerbach Paper Co. . . . . Salt Lake City

WASHINGTON
Blake, Moffitt & Towne . . . Seattle Spokane, Tacoma
Zellerbach Paper Co. . . . . Seattle, Spokane
Spokane Paper & Stationery Company . . . . . Spokane
Morris Paper Co. of W. Va. Clarksburg

WISCONSIN
Wisconsin Paper & Products Co. . . . . Milwaukee
Sawyer Paper Co. . . . . Neenah
Service Paper Co. . . . . Racine

CANADA
F. F. Barber Machinery Co., Ltd. . . . . Toronto, Ontario
Midwest Paper Sales, Ltd. . . . . Winnipeg, Man.

HAWAII
Honolulu Paper Co., Ltd. . . Honolulu

*T. M. REG. U. S. AND CAN. PAT. OFF.

KIMBERLY-CLARK CORPORATION, Neenah, Wisconsin
122 E. 42nd St., New York 17 • 8 S. Michigan Ave., Chicago 3
155 Sansome St., San Francisco 4 • 22 Marietta St., Atlanta 3, Ga.

Automatic Serve-Up Packages

100% Grit Free!

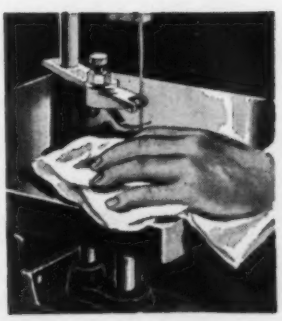
Kimwipes*

industrial tissues

for wiping and polishing

1. INSPECTION WIPING

2. OPTICAL CLEANING



3. MACHINE MAINTENANCE

Downy-soft, 100% free of foreign matter, pleasant to handle, Kim*wipes** industrial wiping tissues pick up the tiniest particles of soil without scratching, without linting. Recommended for use on highly finished surfaces. Flexible to clean corners and hard-to-reach crannies. Absorb up to 15 times their weight in liquids.

So inexpensive that a fresh, clean tissue can be used for each application—and thrown away! "Indispensable" around precision tools and instruments, in shops, laboratories, packing rooms, stores—in almost every type of business. Order a supply of Kim*wipes* from our nearest distributor—see list on page opposite.

Write us on your business letterhead for further information. Address Kimberly-Clark Corporation, Neenah, Wisconsin.

Kimwipes

A PRODUCT OF Kimberly Clark RESEARCH

INDUSTRIAL WIPING TISSUES

*T. M. REG. U. S. AND CAN. PAT. OFF.

NEED ALUMINUM DIE CASTINGS?

Alcoa's 2 modern plants

(GARWOOD, N. J. • CHICAGO, ILL.)

make the best you can buy

Your phone book lists the nearest Alcoa sales office under "aluminum." For prompt quotation, technical books and help based on 62 years of aluminum knowledge . . . call there, or write ALUMINUM COMPANY OF AMERICA, 1906B Gulf Bldg., Pittsburgh 19, Pa.

ALCOA *Aluminum* DIE CASTINGS

ALCOA

The HALLOWELL *WORK BENCH OF STEEL*

Standardized, *ready-made* HALLOWELL Work Benches save trouble and expense of "building your own"; provide superior equipment for maximum productivity.

Interchangeable units readily adaptable to individual requirement. Easily bolted together to form continuous bench, yet may be taken down and reassembled as single units. Rigid, heavy-duty construction eliminates bolting to the floor, minimizes installation and maintenance.

HALLOWELL Work Benches do credit to any plant. Functional design and attractive appearance encourages better plant housekeeping and worker performance.

Full details in Bulletin 701.

SPS STANDARD PRESSED STEEL CO.

JENKINTOWN 31, PENNSYLVANIA

. . . 1909
1950 . . .

41 YEARS YOUNG!

ABBOTT

WHY DON'T YOU

cash in on ABBOTT'S 41 years of "KNOW-HOW" for YOUR Bearing Ball needs. Our customers tell us there's a *new* application every time they look for it! We'll gladly tell you why. Why delay?

? ? ? ? ? ? ?

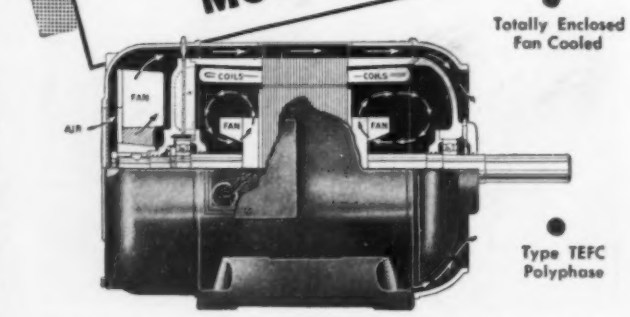
We can also help you solve your BURNISHING PROBLEMS

• • •

LOOK FOR ABBOTT'S NEW MID-CENTURY CATALOG!

THE ABBOTT BALL COMPANY
15 Railroad Place, Hartford 10, Conn.

THE LATEST DEVELOPMENT in **AIR COOLED** Ball Bearing **MOTORS**



Here is the newest and most successful development in air cooled motors. Totally enclosed, constant speed, continuous duty; it is designed for cooler and more economical operation under the hardships of extreme heat and dust. Fully ball bearing and quiet running, too. You will want to know more about this *new* VALLEY Motor.

WRITE FOR DESCRIPTIVE LITERATURE

VALLEY
ELECTRIC CORPORATION
4221 Forest Park Blvd. • St. Louis 8, Mo.

KEEP SHORT RUN STAMPING COSTS DOWN

SEND PRINTS FOR . . . LOW COST QUOTATIONS

Federal
"Controlled Tolerance"
STAMPINGS

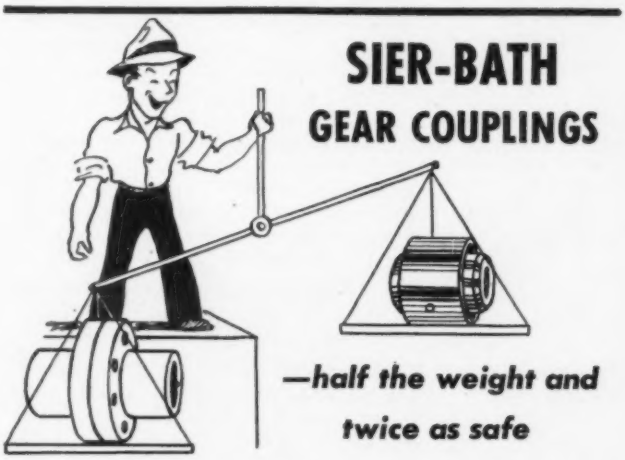
FREDDY FEDERAL SAYS . . . "For experimental or production units . . . it's quality, precision and speed that count . . . and the expert die makers, modern equipment, experienced workmen, and careful inspection at Federal assure quality stampings within 'controlled tolerances' whether 3 or 10,000 stampings are required".

Federal stampings are made in any shape . . . in any size up to 9"x12" . . . any thickness up to 3/16" . . . from any material that can be stamped.

WRITE . . . for this No. 101 Bulletin today!

SEND YOUR PRINTS TODAY . . . you'll be pleasantly surprised over the low cost and prompt deliveries.

Federal TOOL AND MANUFACTURING CO.
3628 ALABAMA AVE. (ST. LOUIS PARK)
MINNEAPOLIS, MINNESOTA
"QUALITY STAMPINGS IN SMALL QUANTITIES"



SIER-BATH
GEAR COUPLINGS

—half the weight and twice as safe

The design of Sier-Bath Gear Couplings is ingenious in its simplicity. As a result it is only half the weight of other couplings of equal capacity. And there are no bolts or nuts to snag clothing or to become rusted solid and require a hack saw to disassemble. By depressing the retaining rings, these couplings can be disassembled in a few seconds with no special tool. Available in sizes from ¾" to 6". Let us send you one in any size up to 2½" for 30 days free trial.

Also manufacturers of precision gears, GEAREX PUMPS and SCREW PUMPS

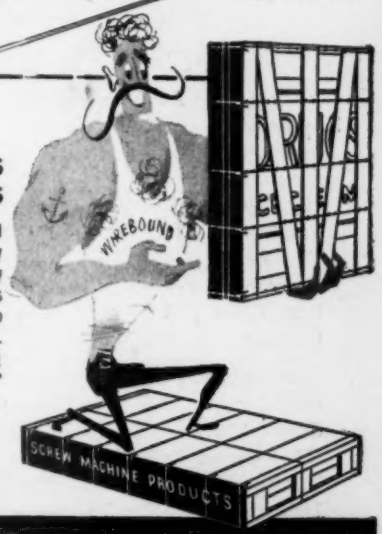
Sier-Bath
Founded 1905
GEAR and PUMP CO., Inc.
9267 HUDSON BLVD. N. BERGEN, N. J.

FOR LOWER TARE WEIGHT

Users of Wirebound Boxes and Crates consistently save 33% on tare weights. In addition, Wirebounds require less storage space, are easily handled, can be set-up in less than a minute, and are ideally suited to modern warehousing.*

FOR GREATER STRENGTH

To assure the utmost product protection in handling and shipping, all Wirebounds are constructed to specifications developed by exhaustive laboratory and field testing. Wirebounds are designed to meet the hazards of shipment and storage of your particular product.*



FOR FRAGILE PRODUCTS
FOR HEAVY PRODUCTS

The adaptability of the Wirebound principle is demonstrated by the variety of containers shown here. Heavy products, delicate products, products of odd or irregular shapes ship safely and at lower cost in Wirebounds. Ask us for suggestions on shipping your product.*

USE Wirebound BOXES & CRATES FOR LOWER TOTAL SHIPPING COSTS

60 Wirebound Plants throughout the United States

*Send for this free book . . . contains the full Wirebound story, technical information and demonstrates how Wirebounds are specifically designed for each product. Mail coupon today!

Wirebound Box Manufacturers Assn., Room 1821, Borland Bldg., Chicago 3, Ill.

☐ Send Booklet of Product Information ☐ Send a Sales Engineer

NAME
COMPANY ADDRESS
CITY ZONE STATE
OUR PRODUCT IS

LETTERS . . .

P. A. REPORTS TO WHOM?

I am endeavoring to determine to whom the purchasing agent reports within his organization, or what the general practice might be in respect to purchasing agents in the medium size and major size companies or corporations.

I should like to determine who is the superior of the purchasing agent. Does he report directly to the general manager, the vice president, the president, or is he in some companies tied in directly or indirectly with the department of finance, which would either be the controller or the vice president of finance?

James E. Kerns, Purchasing Agent
Selas Corporation of America
Philadelphia 34, Pa.

The following information is quoted from the National Association of Purchasing Agents' "Handbook of Purchasing Policies and Procedures." It is based on an extensive survey of the Association membership:

AUTHORITY TO WHOM PURCHASING DEPARTMENT IS RESPONSIBLE

A. In concerns with single plant or localized plants:

	Size of Organization			
	Small	Medium	Large	All Reporting
Responsible to				
President	38%	38%	17%	37%
General Mgr. or Plt. Mgr. etc.	32%	27%	50%	30%
Vice President	17%	20%	17%	18%
Treasurer	6%	12%	——	9%
Secretary	——	2%	16%	2%
Exec. Comm.	3%	1%	——	2%
Comptroller	4%	——	——	2%

B. In concerns with scattered plants:

President	26%	34%	50%	36%
General Mgr. or Plt. Mgr., etc.	37%	21%	17%	23%
Vice President	21%	41%	25%	33%
Treasurer	10%	1%	——	3%
Exec. Comm.	6%	3%	8%	5%

Comment on this table is as follows:

"It should be remembered, in any consideration of the detail shown in the foregoing table and in any statements made as to practice with reference to the officer to whom the purchasing agent is responsible, that the titles of officers are not always indicative of the authority of the officer in question. It is clear, however, that the great majority tendency is towards control of the purchasing department by the executive heads of the business who are responsible for the policies and for the profits of the business; that in some cases this control is exercised by the president directly upon the purchasing department, and in other instances it is vested in the vice president, the executive committee or some other authorized member of the executive department of the concern.

"The term 'general manager' is particularly difficult to define closely. In many answers to questionnaires there is no distinction drawn between general management and plant management. It is fair to assume, however, that the secondary trend as to control of the purchasing department is to place it under plant management as a function of production. This tendency, probably, is not as strong as indicated by the percentages quoted in the tables, since, in many instances, the person referred to as a general manager or simply as a manager is himself responsible for policies and for profits, and is much more than a superintendent, or plant manager, or works manager, in the commonly accepted sense of those terms.

"There is a distinctly minor tendency, which is almost negligible, to vest control of the purchasing department in the treasurer, the comptroller, or other financial officer of the company.

"We may assume from the evidence that the purchasing department is generally considered one of the major functions, subject to executive control, and only under special circumstances, or in minority cases, subject to the control of the manufacturing or production heads. We may further assume that the general policy is for the financial control of the company to act rather as a co-ordinate, or checking, function upon the purchasing function, and in only the rare case to control the purchasing department."

In the same Handbook, there is a report of a study made by J. D. Yoder, Jr., of the Wharton School of Finance and Commerce, covering 25 purchasing departments of companies in the Philadelphia area, purchasing one million dollars or more per year:

"Of the 25 companies interviewed, the purchasing agents report as follows:

9 to the president
5 to the president (the purchasing agent is here also vice president in charge of purchases)
4 to executive vice presidents
2 to the executive committee
2 to the treasurer
1 to the vice president in charge of purchasing and stores
1 to the plant superintendent (a branch office)
1 to the vice president of production."

Our own studies confirm these findings substantially, with only minor variations in percentages shown. This gives a very definite answer to the specific question raised in the second paragraph of your letter. The practice of having the purchasing department report to financial officers of the company is almost negligible.

The reason for this is quite clear when you consider the historical evolution of the purchasing function. Prior to the establishment of purchasing departments as a specialized function of industry, made necessary by large scale industrial organization, purchasing was merely the first step in production, and the production executive bought what was needed for plant operation. When this job became too big and too important to be handled as a side line to production activities, a buyer or purchasing clerk was appointed within the production department. The next step was the establishment of centralized purchasing departments independent of production—the situation which largely prevails today. This resulted from (1) the growth of the purchasing job itself; (2) greater recognition by management of the dollar importance of purchase expenditures, usually 50% or more of total product cost, with corresponding hazards of loss and opportunities for saving in this large proportion of total cost; and (3) to insure that purchasing considerations shall be given equal and objective weight with production considerations in establishing purchasing policies and making purchase decisions. In this case, the role of the production department is to prepare specifications of required quality and to keep the purchasing department apprised of needs. The next logical step, which has been taken in a large number of companies, is to have the production and purchasing officers on the same plane in the company organization, both reporting to executive management.—Ed.

LEGAL AID TO P.A. S

Your monthly articles on the legal side of the purchasing agent's responsibility and problems are always read with a great deal of interest. Are reprints of these articles available?

Further, as a member of the local Association of Purchasing Agents, I am very interested in knowing if they are available as our group is sponsoring a 10-week course on the legal aspects of purchasing, starting in January of 1950. Please let us know the cost of these reprints and the quantity that might be available on any one order.

T. G. Paterson, Jr., Purchasing Dept.
The Gates Rubber Co.
Denver 17, Colo.

The popular series on purchase law, by Leo T. Parker, (see page 142 of this issue) is not regularly reprinted. But we shall be glad to furnish copies in quantity at cost.—Ed.

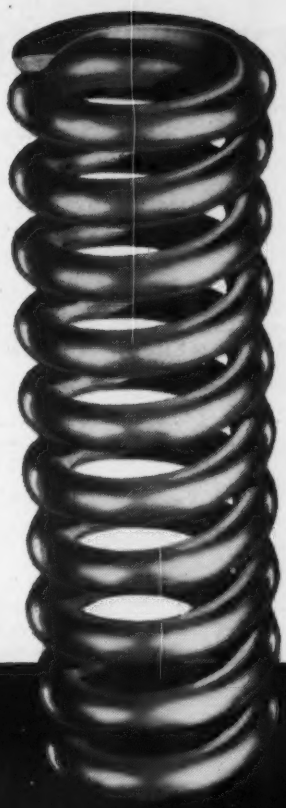
BRITISH PURCHASING SERIES REVEALING

Your series on England is indeed revealing, and I hope you will be able to supply me with a reprint, which I understand are being issued.

I had the pleasure of living in England for many years prior to the war, and would appreciate six copies of the reprint so that I may forward it to some of my friends in England for their enlightenment as well.

C. E. White, Manager, Export Department
Century Electric Co.,
St. Louis, Mo.

Reprints sent.—Ed.



How much should a spring cost?

● It all depends on the job it has to do. Because *overdesign* is just as bad as *underdesign*. You lose both ways—the end product either performs poorly, or it costs too much.

When costs are important, and they usually are, we don't believe in designing springs with unnecessary, elaborate and costly performance characteristics. We don't recommend stainless or high alloy steels if carbon steel will do the job. And we're quick to suggest ways to simplify springs—and cut their cost. You can be sure that, whenever it's possible, our designs will utilize the lowest cost material and fabrication methods that will do a good job for you.

Let our engineering staff—our comprehensive production and testing facilities go to work for you. You'll get a better spring—at a price—that will fit your needs *exactly*.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **AMERICAN · QUALITY SPRINGS**

UNITED STATES STEEL

BUYER'S & SELLER'S MART

Contract Work • Equipment For Sale • Employment and Business Opportunities

RATES

Undisplayed (set solid) ..... 90¢ line
Positions Wanted ..... 45¢ line

Displayed .....$8.50 inch

REQUIREMENTS

Undisplayed (want-ad style), minimum charge 4 lines, prepaid. Figure forty-four letter spaces (five average words) to a line. Add one line for box number address; replies forwarded without charge.

Discount of 10% for twelve consecutive displayed insertions. Forms close 15th of month preceding date of publication.

Send orders to: CLASSIFIED DEPARTMENT • PURCHASING • 205 E. 42nd St., New York 17, N. Y.

WELLS
METAL STAMPINGS

TO TRIM YOUR PRODUCTION COSTS

MAIL US PRINTS OR A BRIEF OUTLINE OF YOUR PROBLEM. OUR PRICES ARE ATTRACTIVE CONVINCINGLY

The savings we can effect thru mechanization and craftsmanship provides plus profits to our clients.

Dies are skillfully designed and built by experts for streamlined production.

Stampings, in all metals, are produced to your exacting specifications, in any quantity and size within the capacity of 10 to 125 ton presses and finished to meet your requirements.

WELLS Manufacturing Co.
SPECIALTY DIVISION
North Liberty, Indiana
Contract Designers, Engineers and Manufacturers of Metal Stampings—Assemblies—New Products

NePSco
NEW ENGLAND PRESSED STEEL COMPANY
Contract Manufacturers since 1914 of "Trouble Free"
METAL STAMPINGS
SPECIALTIES — APPLIANCES
For Industrial and Domestic Users
P. O. BOX 29
NATICK, MASSACHUSETTS

PURCHASING AGENTS

Applications are being received for PURCHASING AGENTS EXCHANGE franchises in major areas throughout the United States and Canada. Here is an unusual opportunity for a qualified P.A., with limited investment, to enter business "on his own." Please write us, giving a resumé of your experience in buying, selling and expediting.

PURCHASING AGENTS EXCHANGE
208 W. 23rd St. New York 11, N. Y.

GOLF BALLS
WHOLESALE PRICES
Worthington....Tommy Armour....$8.00 Doz.
Wilson .....Hol-Hi.....$8.00 Doz.
Par Arrow..Medium Compression..$3.00 Doz.
Send for Complete Price List.
TROPHY GOLF CO.
Box 34 CHICAGO 17, ILL.

AN IMPORTANT MESSAGE
TO MANUFACTURERS
(WITH OR WITHOUT THEIR OWN FOUNDRY)

"CIRCULAR IRON CASTINGS"

can, in most cases, be made by us *without patterns*, thus saving time, trouble and money.

Yes, fine quality, accurate iron castings for Pulleys, Flywheels, Gear Blanks, etc., can be made by us in most any size and quantity. (We've been doing such work for 92 years.)

Send us sketch or blueprints for prices.

T. B. WOOD'S SONS CO.
CHAMBERSBURG, PA.

POSITIONS WANTED

PURCHASING AGENT — Engineering background with 15 years experience in industrial purchasing. Seven years in complete charge of purchasing for aviation engine parts manufacturer. Heavy in industrial equipment, machinery, ferrous and nonferrous metals. Knowledge of machine shop practice and sub-contracting. H. H. Bickell, 129 Newkirk St., Jersey City, N. J.

PURCHASING AGENT—ASS'T P. A. OR ASS'T TO PRES: 31 years old B. S. in Business Administration with 5 years experience in industrial material procurement, expediting, production and inventory control, standard costs, traffic, export. Member NAPA. Aggressive, executive level, married. Have reached ceiling in present position. Desire challenging position with heavy responsibility. Locate anywhere. Replies confidential. Data Sheet on request. Address Box 1255, PURCHASING, 205 E. 42 St., N. Y. 17.

PURCHASING AGENT or ASSISTANT—Graduate Mechanical Engineer. Presently employed Asst. Purchasing Agent. Experience includes supervision all phases purchasing, large departments, buying large volume diversified materials, estimating, controlling inventories, etc. One year Sales Engineering, three in production, inspection, quality control, engineering, cost accounting. Desire position in purchasing or administration assistant. Age 35. Good appearance, veteran, industrious. Box 1254, PURCHASING, 205 E. 42 St., N. Y. 17.

COLD FINISHED BARS
ROUNDS—SQUARES—HEXAGON
In Warehouse Stock
For Immediate Shipment
BARON STEEL COMPANY
4075 Detroit Avenue Toledo 12, Ohio

VAN PADS • DOLLY TRUCKS
Appliance Trucks, Hand Trucks, Piano-moving Equipment, Furniture Pads, Appliance Covers, Refrigerator Covers, Carrying Straps, Furniture Repair Kits, etc. Write for new illustrated price catalog.
ELKAY PRODUCTS CO.
323-27 W. 16th St., New York 11, N. Y.
Phone: WAtkins 9-1148

Our candid camera man catches Mr. J. L. "Lew" Unsworth, Manager (left), and Mr. Charles Reese, both of John A. Roebling's Sons, Philadelphia Branch, going over their new "Wire Rope Handbook" with Mr. R. H. Anders, Director of Purchases, Sun Oil Company (right).

"Help the P.A. — he can help you"

"We consider the purchasing agents' goodwill a tremendous asset. Knowing that P.A.'s are busy, I always insist that my men, in their frequent calls on purchasing executives, make it as easy as possible for them to do business with our company," says Mr. Lew Unsworth, genial head of Roebling's sales in the Philadelphia territory.

"Our Advertising Department," continues Mr. Unsworth, "is in full accord with this policy. Roebling's extensive advertising campaign in PURCHASING Magazine is designed to help the P.A. by providing him with essential information about Roebling products."

To *anyone* who sells to industry, the purchasing agents' goodwill is a tremendous asset. Make it as easy as possible, then, for P.A.'s to do business with your company — include in your sales effort consistent, informative advertising in PURCHASING.

The *one* national magazine tailored to the exact requirements of the key man in industrial buying, PURCHASING is read regularly by P.A.'s controlling some 85% of industry's purchases. *Eighty-five per-cent!* Any wonder that more than 600 sales-alert companies advertised in PURCHASING during 1948? For more facts, write PURCHASING, 205 East 42nd Street, New York 17, N. Y. Offices in Chicago, Cleveland, Dallas, Los Angeles.

PURCHASING

ABC

A CONOVER-MAST PUBLICATION

THE NATIONAL MAGAZINE FOR PURCHASING EXECUTIVES

Advertisers IN THIS ISSUE

A

Abbott Ball Company, The 306
Accurate Spring Mfg. Co. 256
Acme Steel Co. 196
Adam Electric Co., Frank 149
Air Express Div., Railway Express Agency, Inc. 186
Air Reduction Sales Co. & Subsidiaries 165
Allen Mfg. Co. 250
Allison Company 292
Aluminum Company of America 257, 306
Aluminum Goods Mfg. Co. 21
American Brake Shoe Company, National Bearing Div. 45
American Chain Div. 252
American Chain & Cable Co., Inc. 82, 240, 252, 280
American Optical Co. 56
American Steel & Wire Co. 309
Anchor Post Fence Co. 178
Anti-Friction Bearing Distributors' Association, The 205
Arrow Fastener Company 242
Associated Spring Corp. 74
Atkins & Co., E. C. 60

B

Babcock & Wilcox Tube Co. 259
Barnes Co., Wallace 74
Barnes Co., Ltd., Wallace, The 74
Barnes-Gibson-Raymond 74
Bassick Co., The 316
Bay State Tap & Die Co. 314
Beall Tool Div., Hubbard & Co. 278
Behr-Manning Corp. 48
Bemis Bro. Bag Co. 181, 254
Bendix Aviation Corp., Scintilla Magneto Div. 155
Best Pencil Company, Richard 225
Bethlehem Steel Co. 299
Billings & Spencer Co. 248
Blaw-Knox Co. 296
Bond Foundry & Machine Co. 276
Boston Woven Hose & Rubber Co. 71
Bridgeport Brass Co. 198
Bristol Brass Corp. 268, 269
Brown Instrument Div. 237
Brown & Sharpe Mfg. Co. 35
Brownville Paper Co. 218

C

Campbell Chain Company 298
Carborundum Co., The 79
Carnegie-Illinois Steel Corp. 289
Carpenter Alloy Tube Div. 76
Cel-U-Dex Corporation 220
Central Paper Company 300
Central Paper Company, Inc. 190
Century Electric Company 3
Champion Lamp Works 168
Chase Bag Company 203
Chase Brass & Copper Co., Inc. 72
Chester Hoist Div., National Screw & Mfg. Co. 234
Cities Service Cos. 191
Clark Bros. Bolt Co. 158
Classified Advertising Section 310
Clemson Bros., Inc. 280
Cleveland Cap Screw Co. 270
Cleveland Chain & Mfg. Co. 24
Cleveland Container Co., The 300
Cleveland Twist Drill Co. 273
Cold Metal Products Co. 147
Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div. 51, 176
Colson Corp., The 174
CONOVER-MAST PURCHASING DIRECTORY 226
Consolidated Business Systems, Inc..... 229
Consolidated Electric Lamp Co., Champion Lamp Works 168
Consolidated Molded Products Corp..... 68
Container Corp. of America 77
Continental Diamond Fibre Co. 255
Continental Screw Co. 302
C-O-Two Fire Equipment 244
Crane Company 67
Crucible Steel Company of America 188, 189

D

Darnell Corp., Ltd. 242
Dennison Mfg. Co. 193
Disston & Sons, Inc., Henry 169
Dodge Manufacturing Corp. 38
Doehler-Jarvis Corp. 167
Dolge Co., C. B. 236
Dow Chemical Company, The 64
Dravo Corp. 284
Dunbar Bros., Co. Div. 74

E

Eagle Mfg. Co. 158
Eaton Mfg. Co. 295
Eberhard-Faber Pencil Co. 214
Elastic Stop Nut Corp. of America 275
Elco Tool & Screw Corp. 282
Electric Auto-Lite Co. 243
Electric Storage Battery Co. 161
Electric Wheel Company 254
Emerson Electric Mfg. Co. 246
Equitable Paper Bag Co. 222
Erie Bolt & Nut Co. 290
Esleeck Mfg. Co. 229
Etching Company of America 202
Ex-Cell-O Corp. 253

F

Fafnir Bearings Co. 303
Federal Tool & Mfg. Co. 307
Federated Metals Div., Amer. Smelting & Refining Co. 32
Fenton Label Co. 226
Ferry Cap & Set Screw Co. 30
Flexible Steel Lacing Co. 284
Frasse & Co., Inc., Peter A. 233
Fuller Brush Co. 62

G

Garrett Co., Inc., George K. 180
Gates Rubber Co. 78
General Box Co. 235
General Electric Company Apparatus Div. 182, 183
Lamp Div. 43
General Tire & Rubber Co. 238
Gerson-Stewart Corporation 200
Gibson Co., William D., The 74
Gits Bros. Mfg. Co. 50
Gits Molding Corp. 288
Globe Steel Tubes Co. 271
Goodrich Co., B. F. 4, 61
Goodyear Tire & Rubber Co., Inc. 39
Gould Storage Battery Corp. 231
Graybar Electric Co., Inc. 80
Grinnell Co., Inc. 25
Gulf Oil Corp. 173

H

Harnischfeger Corp. 73, 152, 153, 209
Herbrand Div., Bingham-Herbrand Corp. 174
Heyer Corp., The 228
Hinde & Dauch Paper Co. 55
Hodell Chain Co., Div. National Screw & Mfg. Co. 292
Howell Electric Motors Co. 277
Hudson Pulp & Paper Corporation 28
Hussey & Co., C. G. 8

I

Illinois Glove Company 290
Indiana State Chamber of Commerce 272
Industrial Tape Corporation 286
Inland Steel Company 5
International Paper Co. 215

J

Jenkins Bros. .....4th Cover
Johns-Manville Corp. 313
Johnson Steel & Wire Co., Inc. 294

K

Kaiser Aluminum & Chemical Corp. 29
Kearney & Trecker Corp., Walker-Turner Div. 33
Keasbey & Mattison Co. 59
Kempsmith Machine Co. 274
Kex National Service 160
Keystone Steel & Wire Co. 184
Kimberly-Clark Corp. 267, 304, 305
Krengel Mfg. Co., Inc. 154

L

Ladish Co. 162, 163
Laminated Shim Co., Inc. 63
Link-Belt Co. 11
Lunkenheimer Co. 54
Lyon Metal Products Inc. 187

M

Macwhyte Co. 15
Marsh Corp., Jas. P. 293
Master Electric Co. 49
Mesta Machine Co. 279
Micro Switch 27
Midwest Piping & Supply Co. 145
Mills Corporation, Elmer E. 197
Milwaukee Dustless Brush Co. 208
Mine Safety Appliances Company 281
Missouri-Kansas-Texas Lines 52
Morris Company, Bert M. 228

N

National Bearing Div., Amer. Brake Shoe Co. 45
National Blank Book Company 213
National Electric Products Corp. 179
National Forge & Ordnance Co. 36
National Lead Co. 241
National Pencil Co. 228
National Sanitary Supply Assn. 158
National Screw & Mfg. Co. 234, 262, 292
National Starch Products, Inc. 251
National Supply Co., Spang-Chalfant Div. 207
Newark Wire Cloth Co. 194
Nicholson File Co. 13
Norton Company 48
Nox-Rust Chemical Corp. 157

O

Oakite Products, Inc. 166
Ohio Brass Company 177
Ohio Division, Association Spring Corp. 74
Ohio Injector Co., The 17
Okonite Company 315
Olympic Glove Co., Inc. 242
Osborn Mfg. Co. 7
Oxford Filing Supply Co. 229

P

Page Fence Association 190
Page Steel & Wire Div. 280
Paisley Products Inc. 75
Parker-Kalon Corp. 10
Pittsburgh Plate Glass Co., Brush Div. 156
Pittsburgh Plate Glass Co., Columbia Chemical Div. 84
Plumb, Inc. Favette R. 247
Powell Co., William 46
PURCHASING Magazine 311
Purdy & Co., Inc., A. R. 301
Pyrene Mfg. Co. 258

Q

Quinn-Berry Corporation 26

...new handy selector for pump packings

If you're using reciprocating or centrifugal pumps . . .

If your packing seals against fresh or salt, hot or cold water, steam, oil, brine, ammonia or other fluids and chemicals . . .

If you want to know the correct packing for each application . . .

If you're interested in using fewer styles of packing to do the job . . .

. . . Then you'll want this new J-M Packing Selector to keep on hand.

This handy new packing selector gives you brief, specific data on ten popular styles of Johns-Manville Packings that serve over 90% of all pump packing applications . . . shows you where to use each style for greatest efficiency and economy of service.

Here's the quick, easy way to check on your pump packing efficiency . . . to find out about lower packing costs . . . to get higher efficiency and longer life from your packings. Use the coupon, or write for your copy today to Johns-Manville, Box 290, New York 16, N.Y.

JM PRODUCTS

Johns-Manville

PACKINGS & GASKETS

Johns-Manville
Box 290, New York 16, N. Y.

Please send me your packing selector for **reciprocating** and centrifugal pumps (PK-39A).

Name_____

Firm_____

Address_____

City_____ State_____

P-2

R

Railway Express Agency, Inc., Air Express Div. 188
Randolph Laboratories, Inc. 185
Rathborne, Hair & Ridgway Co. 44
Raymond Mfg. Co. 74
Reliance Electric & Engineering Co. 239
Remington Rand, Inc. 210, 216, 217
Republic Steel Corp. 245
Revere Copper & Brass Inc. 170
Richardson Co., The 164
Ridge Tool Co. 206
Rising Paper Co. 224
Riverside Metal Company 159
Roebling's Sons Co., John A. 57
Rolock, Inc. 47
Ryerson & Son, Inc., Joseph T. 86

S

Sawyer & Son Co., The H. M. 204
Scovill Manufacturing Co., Waterville Div. 172
Security Steel Equipment Corp. 223
Set Screw & Mfg. Co. 200
Sheffield Tube Corporation, The 283
Sheppard Envelope Co. 226
Sier-Bath Gear & Pump Co. 307
Simonds Gear & Mfg. Co. 172
Simonds Saw & Steel Co. 291
Socony-Vacuum Oil Co., Inc. 41
Solvay Sales Div., Allied Chemical & Dye Corp. 199
Southwestern Porcelain Steel Corp. 284
Spang-Chalfant Div., National Supply Co. 207
Speer-Carbon Company 236
Spengler-Loomis Mfg. Co., Automatic Pencil Sharpener Div. 224
Sponge Rubber Products Co. 201
Standard Pressed Steel Co. 174, 306
Stanley Electric Tool Div. 22
Starrett Co., The L. S. 6
Sterling Bolt Co. 23
Strathmore Paper Co. 221
Strom Steel Ball Co. 256
Strong Carlisle & Hammond Company 180
Sturtevant Mill Co. 34
Sun Oil Co. 265
Superior Steel Corp. 263
Synthane Corp. 260, 261

T

Taylor Co., Halsey W. 222
Texas Company .....2nd Cover
Thermoid Co. 58
Timken Roller Bearing Co. 69
Towmotor Corp. 166
Townsend Co. 42
Tri-Lok Company 284
Triplex Screw Co. 192
Trumbull Electric Mfg. Co. 297

U

Uarco, Inc. 227
Udylite Corp. 53
Union Bag & Paper Corp. 37
U. S. Rubber Co. 249
U. S. Steel Supply Co. 18
U. S Steel Wire Spring Co., The 304

V

Valley Electric Corp. 306
Van Dorn Electric Tool Co. 31

W

Wagner Electric Corp. 70
Walker-Turner Div., Kearney & Trecker Corp. 33
Walworth Company 40
Ward Steel Company 175
Webster Co., F. S. 219
Weirton Steel Co. 195
West Disinfecting Co. 9
Westinghouse Electric Corp. ....3rd Cover
Wheeler Reflector Co. 285
Whitney Chain & Mfg. Co. 171
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp. 51, 176
Wirebound Box Manufacturers Asso. 307
Wisconsin Motor Corp. 274
Wright Hoist Div. 82
Wrought Washer Mfg. Co. 288

Y

Yale & Towne Mfg. Co. 287
Youngstown Sheet & Tube Co. 151

HAZEL-ATLAS
installs

OKOLITE-OKOPRENE

SELF-SUPPORTING AERIAL CABLE

for

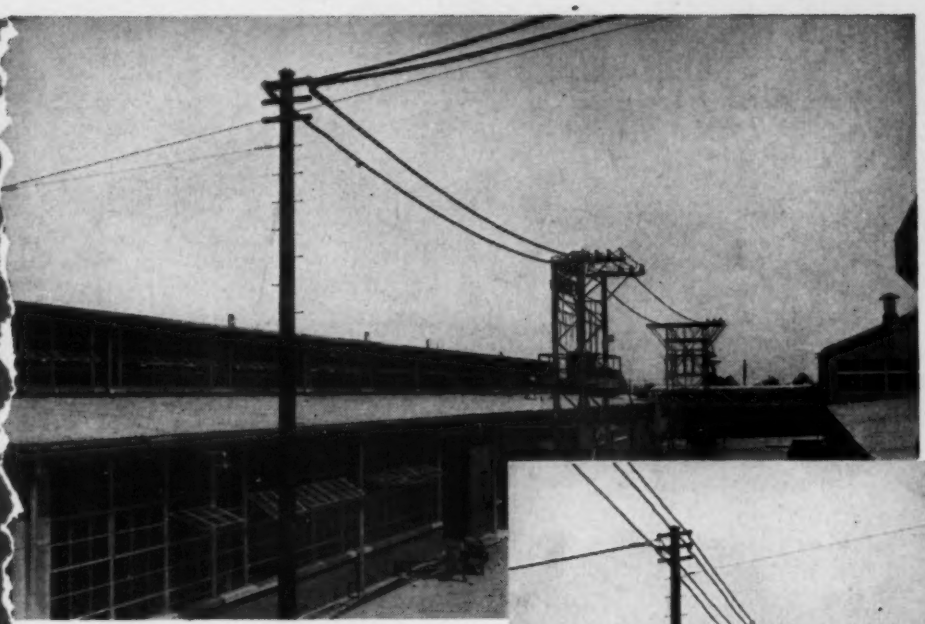
compactness

durability

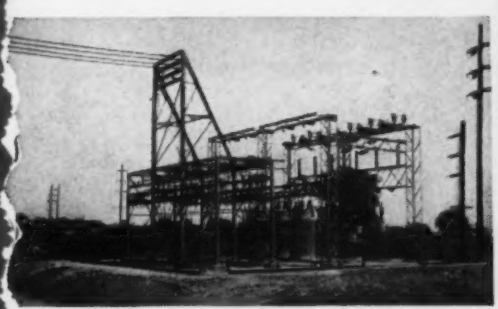
dependability

ENGINEERS
PETER F. LOFTUS CORP.,
PITTSBURGH, PA.

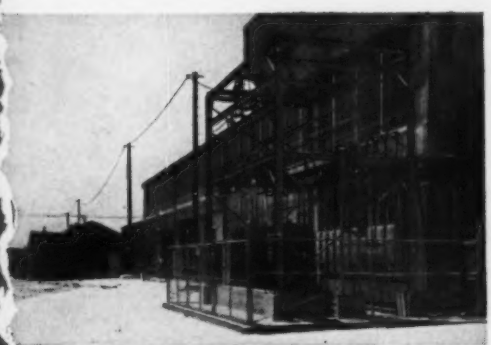
ELECTRICAL CONTRACTOR
HARRY ALEXANDER, INC.,
WASHINGTON, D. C.



COMPACTNESS— self-evident space economy eliminates congestion, reduces clearance problems, gives a neater, more streamlined appearance in keeping with modern efficiency. Simple line tap, permitted with Okonite's Dualay* construction, serves the 2300/440 volt steel platform substation.

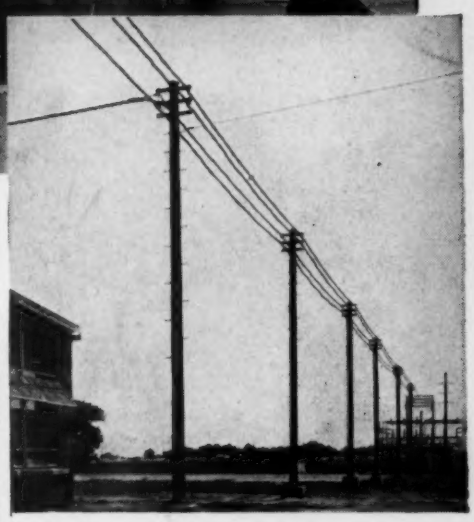


DEPENDABILITY— "stormsafe;" fewer service interruptions or outages; improved circuit regulation because of lower reactance; freedom from lead sheath troubles. 44kv/2.3kv jointly operated transformer and switching substation containing the Alabama Power Co. step-down transformer and the Hazel-Atlas Glass Co. outdoor oil circuit-breakers shown above.



ECONOMY— save on installation as well as maintenance costs with Okonite S/S cable. Reasonable first cost; simple, quick installation. Long spans require fewer poles; fewer items to be purchased and stocked. Exclusive Dualay assembly permits ample separation of conductors without cutting copper conductors or performing any operation on messenger. Practically no maintenance is required.

*U. S. Pat. 2430378



DURABILITY— no ring-cutting; permanently weatherproof, non-conducting Okoprene sheath; high-voltage, heat and moisture resisting Okolite insulation. These Okonite values mean long-lived, trouble-free circuits. Four circuits above are carried from station (background) on pedestal-mounted tubular steel poles with steel cross arms welded in place.

Four thousand feet of Okolite-Okoprene "Line-Tap" Self-Supporting Aerial Cable serve the new plant of the Hazel-Atlas Glass Company at Montgomery, Alabama. According to company officials, this installation provides a compact, durable and dependable arrangement, in keeping with the modern efficiency of the plant. It represents another proof of the advantages of Okonite Self-Supporting Cable for industrial applications.

Outdoors, on poles or on brackets attached to buildings – or indoors, where circuits can be carried overhead supported by beams or trusses – Okolite-Okoprene Self-Supporting Aerial Cables provide a modern, dependable and economical method of industrial power transmission. They are described in a 52-page manual available to electrical engineers and company executives. For your copy, send a request on your letterhead to The Okonite Company, Passaic, N. J.

THE BEST CABLE IS YOUR BEST POLICY

OKONITE SINCE 1878 *insulated wires and cables*

Handling toilet bowls on Bassick "Floating-Hub" Casters at American Radiator and Standard Sanitary Corporation's Torrance Works in California.

LET'S GO TO WORK ON THE

Reducible 30%

Cost analysts say materials-handling generally runs about 30% of total manufacturing costs. Further, they point out, most other costs—wages, taxes, plant overhead—are not readily susceptible to reduction. Which means—look to materials-handling for cost savings . . . find your extra margin of profit in materials-handling's "Reducible 30%."

THIS "FLOATER" ATTACKS THE Reducible 30% 3 WAYS!

Famous Bassick "Floating-Hub" Caster—(1) speeds movement of parts and products; (2) protects loads, particularly liquids, fragile materials, delicate or highly-finished parts, from damage; (3) reduces wear and tear on floors, trucks and dollies.

Investigate "Floating-Hub" Casters . . . and other Bassick products—grooved-wheel casters running on angle iron track, position locks, etc.—that reduce your costs by saving assembly time and reducing maintenance on floors and "rolling stock."

For bulletins on Bassick casters and wheels, write to THE BASSICK COMPANY, Bridgeport 2, Conn. DIVISION OF STEWART-WARNER CORPORATION. *In Canada:* BASSICK DIVISION, Stewart-Warner-Alemite Corporation, Ltd., Belleville, Ontario.

"Floating-Hub" Caster carries the load off hub-center, cushioned by shock-absorbing spring. The load "floats" over bumps—no bounce, no shimmy, no tipping.

Bassick

Making more kinds of Casters . . . Making Casters do more

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

HOW LONG

will the Life-Line bearing last?

As long as comparable periodically lubricated bearings—or longer!

BEARING MANUFACTURERS SAY: "Pre-lubricated bearings have the same life expectancy as periodically lubricated bearings *IF those periodically lubricated bearings are perfectly maintained.*" But how often is a bearing perfectly maintained? Not often enough! That's why Life-Line pre-lubricated bearings offer fewer motor outages due to lubrication faults.

OPERATING RECORDS SAY: "41% fewer failures with Life-Line pre-lubricated bearings!" Life-Line motors placed in service throughout industry show a record of 41% fewer bearing failures than the best conventional motor (with conventional bearings) ever built by Westinghouse!

USERS SAY: "Life-Line bearings save me money." One motor user reports yearly lubrication costs of $3.06 per motor on ordinary motor bearings. An industry average indicates a yearly cost of $2.70 per motor a year. Multiply this by the hundreds of motors in your plant and you'll see why pre-lubricated Life-Line offers you an opportunity to cut life costs of motors. Life-Line needs no lubrication. You save this cost.

Get all the facts on Life-Line motors. See for yourself how much you can save. Ask your Westinghouse salesman for copies of "Facts on Pre-Lubricated Bearings," (B-4378) and "Motor Costs" (B-4321), or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.

J-21585

Westinghouse *Life-Line* Motors

INDUSTRY'S LEADING MOTOR

Life expectancy dictates JENKINS VALVES

for the new John Hancock Building

Architects: CRAM & FERGUSON, Boston, Mass.

Builders: TURNER CONSTRUCTION CO., Boston, Mass.

Contractors for Heating, Ventilating, and Air Conditioning
BUERKEL & CO., INC., Boston, Mass.

FROM TELEVISION MAST to sidewalk snow-melting system, the new John Hancock Mutual Life Insurance Company Building has been skillfully planned for operating efficiency and economy, now, and in the years to come.

All equipment was chosen with an eye to the future—*future maintenance and operating costs.* It was on this basis that Jenkins Valves were selected.

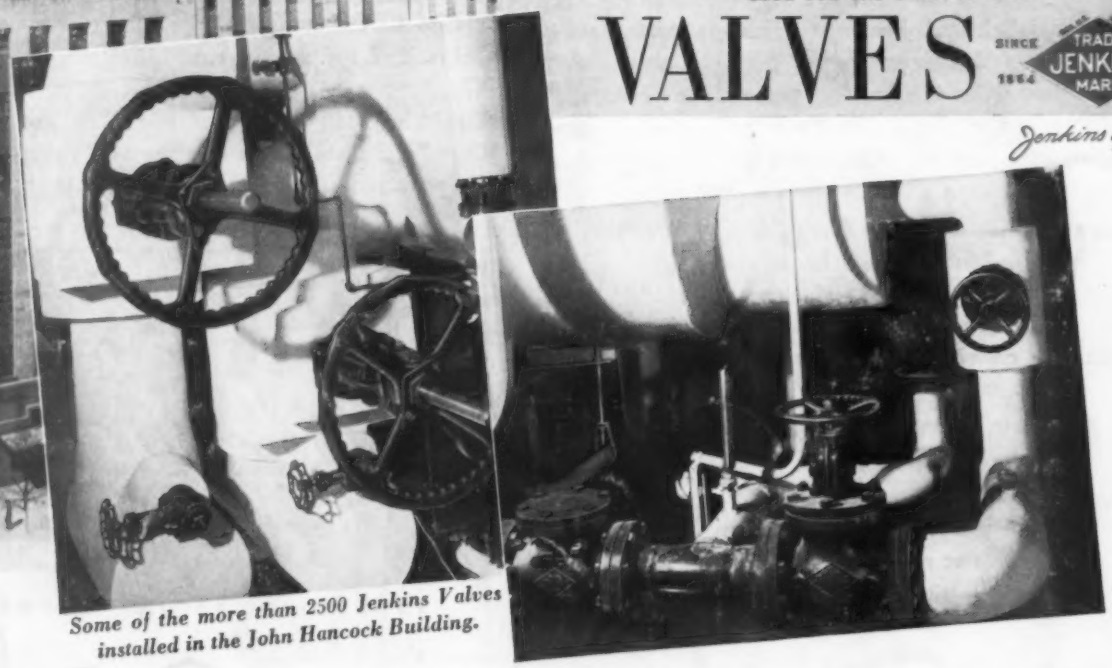
Leading architects, engineers, and contractors have specified Jenkins Valves for the nation's most efficiently planned and operated buildings and plants for over 85 years. First, because they know that Jenkins builds extra endurance into valves—proved by long life and low upkeep cost records in every type of service. Second, because they know the value of the unequalled experience Jenkins Engineers can apply to any question of selection, installation, or maintenance.

Take the long view on valve economy . . . for new installations, for replacements, rely on Jenkins Valves for lowest costs in the long run. *Sold through leading Industrial Distributors everywhere.*

Jenkins Bros., 80 White St., New York 13;
Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago;
San Francisco. Jenkins Bros., Ltd., Montreal.

JENKINS
LOOK FOR THE DIAMOND MARK
VALVES
SINCE 1864
TRADE JENKINS MARK

Jenkins Bros



Some of the more than 2500 Jenkins Valves installed in the John Hancock Building.